

Submission to An Bord Pleanála – Strategic Housing Development

Name of person making submission: Protect East Meath Limited

Name of representative: FP Logue Solicitors

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Fee enclosed: €20

By hand – 5 September 2019

The Secretary
An Bord Pleanála
64 Marlborough Street
Dublin 1

Reference Number: 305110 (Strategic Housing Development)

Developer: Ravala Limited

Description: Proposed development of 450 no. residential units (81 no. houses and 369 no. apartments), creche and associated works at Newtown, Marsh Road & McGrath's Lane Railway Terrace, Drogheda, Co Louth.

Dear Secretary

We set out in this letter the observations of Protect East Meath Limited (Company No 495141) in respect of Ravala Limited's application for planning permission. The observations will identify deficiencies in the developer's application and set out how the consent procedure should be handled under the Habitats Directive¹, Environmental Impact Assessment Directive² (**EIA Directive**) and the Strategic Environmental Assessment Directive³ (**SEA Directive**).

Protect East Meath is not opposed to the principle of residential development at this location or the Southern Environs of Drogheda generally but is concerned that traffic from this area becomes concentrated in Julianstown thereby generating harmful noise and air pollution. These aspects need to be assessed by the Board as a matter of law. Protect East Meath considers that once these assessments are done they will show that in the absence of mitigation the proposed development will lead to unacceptable increases in traffic in Julianstown and consequently increased air and noise pollution which are extremely harmful to human health. Therefore the application should be rejected by the Board.

Protect East Meath also has serious concerns that the information provided by the developer relating to the Boyne Estuary SPA and to bats is deficient. Granting permission would be unlawful in light of

¹ Directive 92/43/EEC

² Directive 2011/92/EU (as amended by Directive 2014/52/EU)

³ Directive 2001/42/EC

the strict protection afforded to bats and the admitted disturbance and the apparent risk of roost destruction.

In respect of birds, there is no over-wintering bird survey which is crucial since the development location is only several hundred metres from the Boyne Estuary SPA and has the characteristics of ex-situ locations used by the SCI species for roosting and feeding. Equally there is no assessment of disturbance from walkers (including with dogs) or cyclists generated by the proposed development.

With the information submitted by the developer with the application, the Board lacks the jurisdiction to grant this application.

Subject Matter of the Submission

In essence the development, if built, will increase the concentration of vehicular traffic on the main street (R132) in the village of Julianstown which lies to the South of the development site on the R132 between Drogheda and Junction 7 of the M1. The volume of traffic on this street is already far in excess of its design capacity⁴. Noise levels assessed under the Environmental Noise Directive⁵ exceed WHO guidelines for both L_{DEN} and L_{NIGHT} . While no relevant published air quality data appears to exist, it is to be expected that air pollution in the village is significant and likely to exceed both WHO and EU thresholds.

Meath County Council, has identified the growth of Drogheda as contributing to the worsening traffic situation in Julianstown making it likely that the proposed development will lead to significant, negative, permanent adverse environmental effects in Julianstown. Given that crucial environmental indicators are already exceeded in Julianstown and bearing in mind that it is an urban area with sensitive receptors including a school and creche on the main street there is therefore a requirement for the Environmental Impact Assessment (EIA) to assess the impact of the proposed development on the environment and the risks to human health in Julianstown.

The information provided by the developer is deficient and does not meet the requirements of Annex IV of the EIA Directive. It does not provide a complete baseline and an outline of the evolution of it in the absence of the development because the environment in Julianstown and the evolution of traffic volumes and air and noise pollution are not included. Equally the effect of increased vehicular traffic is not assessed at all due to a traffic and transport assessment that is deficient in a number of ways. Similarly, even though the information presented indicates significant traffic increases on the R132, there is no evaluation of the results of the strategic noise mapping under the Environmental Noise Directive. The treatment of noise in the EIAR is limited only to on-site noise and not to increased traffic noise on the R132.

The treatment of bats is deficient in light of their strict protection and it appears to be accepted that there will be permanent reduction of the feeding capacity of the site for bats. It also appears to be accepted that there is at least the risk of roost disturbance given that mitigation and compensation measures are proposed. The bat assessment acknowledges implicitly that roost surveys are incomplete and that further surveys will be undertaken. A decision to grant permission in light of the bat assessment would breach article 12 of the Habitats Directive.

This development is in a location that was zoned under the Drogheda Borough Development Plan 2011 to 2017 (as varied). This plan has now expired and Drogheda Borough Council has been abolished with the development site now located in the functional area of Louth County Council. In its development

⁴ Meath County Council: Julianstown R132: Preliminary Business Case (page 11)

⁵ Directive 2002/49/EC

plan Louth County Council indicated that it would make a Local Area Plan for Drogheda but has yet to do so. The expired Drogheda Borough Development Plan 2011 to 2017 has no legal effect, and even if it had the extension of this plan into a period beyond 2017 has not been subject to a new or updated strategic environmental assessment or appropriate assessment and therefore a decision to grant planning permission based on the policies of this plan would be unlawful.

Reasons, considerations and arguments on which the submission is based

We set out below the relevant environmental indicators for Julianstown.

Vehicular Traffic

Environmental Indicator:	Annual traffic volumes are in excess of 20,000 AADT with peak months exceeding 22,000 AADT (see Figure 1 and Table 1). These volumes are increasing at a rate of approximately 2% per annum since 2013.
Data Source	TII traffic counter installed in Julianstown (https://www.nrtraffdata.ie)
Relevant threshold	TII Design Manual for Roads and Bridges – Volume 6 Section 1 Part 1 NRA TD 9/12
Status	Traffic volumes currently exceed indicative capacity of Type 2 dual carriageway and are increasing at approximately 2% per year.

Road Traffic Noise

Environmental Indicator	L _{DEN} and L _{NIGHT}
Data Source	TII Strategic Noise Mapping 2017 (https://www.tii.ie/technical-services/environment/noise-maps/)
Relevant Thresholds	L _{DEN} < 53 dB and L _{NIGHT} < 45 dB (WHO Environmental Noise Guidelines for the European Region 2018)
Status	2017 noise mapping indicates L _{DEN} between 70 and 74 dB and L _{NIGHT} between 60 and 64 dB – exceedance of 15 to 20 dB on both indicators

Air Quality

For the purposes of the Clean Air for Europe Directive Julianstown is located in Zone D. There does not seem to be any data available on air quality in Julianstown, although air quality is one of the monitoring indicators identified under the strategic environmental assessment of Variation No 2 the CDP. The results of this monitoring should be sought from the local authority, if they are not available the developer should be required to conduct air quality monitoring in Julianstown.

Meath County Council's analysis of Julianstown traffic

In a letter to the Department of Transport, Tourism and Sport dated 14 March 2017 Meath County council highlights the worsening traffic situation in Julianstown. Meath County Council considers that the majority of the residents of Drogheda and the coastal strip of Meath access the M1 at junction 7 to the South of Julianstown. In this letter Meath County Council points out that the EIS for the M1 toll plaza scheme underestimated traffic levels in Julianstown and that future growth of Drogheda will further increase pressure on the roads which pass through the village.

A study by AECOM, commissioned by Meath County Council modelled various scenarios for Julianstown and concluded that the construction of the distributor road in the Bryanstown area would only reduce traffic by 2% whereas a bypass would reduce traffic by 82%.

In the “Julianstown R132: Preliminary Business Case” dated December 2018 Meath County Council presented the business case for the proposed Julianstown Bypass to the Department of Transport Tourism and Sport. This business case acknowledges that traffic volumes in Julianstown are high and notes that the transport corridor between Drogheda and Dublin city centre is forecast to have high transport demand with a 72% car modal share. The report showed data that indicates traffic volume is now at 83% of the pre-M1 level. According to the report, while the M1 accommodates strategic through traffic growth across the region, the R132 provides local access to Duleek, Bettystown, Laytown and South Drogheda accommodating local growth in these areas. Meath County Council considers the R132 is not fit for purpose given the large volumes of daily traffic. Figure 2 of this report shows that almost 90% of southbound peak morning traffic coming from South Drogheda continues through Julianstown and that this traffic accounts for approximately 41% of the morning southbound peak traffic flow in Julianstown. This volume is consistent with the relative populations of South Drogheda and East Meath.

Meath County Council acknowledges that the following issues in Julianstown need to be alleviated:

- High journey times due to congestion
- Unsafe conditions for all road users, particularly pedestrians and cyclists
- Unhealthy environment due to air pollution, vibration and noise
- Lack of resilience of the transport network in north-east Meath given increased future demands.

Copies of these documents are included in Annex 1 and 2.

Deficiencies in the traffic and transport assessment

The following deficiencies are identified.

The Traffic and Transport Impact Assessment (**TTIA**) does not comply with the TII guidelines and should have assessed the impact on Julianstown of traffic generated by the proposed development. In particular, the TTIA should have identified the TII traffic counter in Julianstown as an information source and identified the potential impact on Julianstown because the development is part of incremental development in south Drogheda which will increase peak time traffic in Julianstown - an area already congested with traffic levels exceeding design capacity. The village also has road traffic noise in excess of WHO guidelines and there is *prima-facie* evidence based on traffic volumes that air quality thresholds have been exceeded particularly in the vicinity of sensitive receptors.

The TTIA is based on an unsupported assumption that 80% of the peak traffic leaving the site will turn left towards Drogheda. There is no evidence that the developer has considered the morning peak hour destinations of traffic coming from analogous locations and in particular quantified the proportion of traffic that will travel towards junction 7 of the M1 to access the Drogheda – Dublin corridor. In fact it is more likely that the majority of traffic will turn right towards the Mill Road. This is because (a) there are four schools at this location and (b) this is the most direct route (avoiding all signalised junctions in Drogheda) between the development site and the M1 Junction 7. It seems likely that traffic coming from this development will lead to a high proportionate increase in traffic coming from Drogheda travelling South on the R132 through Julianstown (estimated to be already in the region of 500 at peak hour by Meath County Council).

Finally, the TTIA is exclusively concerned with junction capacity in the direct vicinity of the development site. It has no analysis whatsoever of the impact on the wider network the resilience of which has already been identified as being under pressure by Meath County Council. There is objective evidence and data from several sources that housing development in this area is concentrating traffic on the R132 in Julianstown but all of this has been overlooked rendering the TTIA incomplete.

Habitats Directive - Boyne Estuary SPA

The development site is identified as being located 330m from the Boyne Estuary SPA, the second most important estuary for wintering birds on the Louth/Meath coastline.

The information relating to overwintering birds is insufficient for the Board to lawfully grant planning permission. The only “survey” identified by the developer is a site visit by unidentified personnel in May 2018. There has been no survey of the extent of the use of the site for roosting and feeding by the SCI species. The site visit took place during a period that is not suitable for winter bird surveys and there is no evidence that any actual surveying took place or that the personnel who visited the site had appropriate qualifications. There seems to be an implicit assumption in the application documents that the development site is not ecologically connected with the SPA, however given the proximity and the mobility of bird species this can only be established with best scientific evidence and the developer and/or its consultants have failed to provide any such evidence. Ex-situ factors and the reliance of the listed waterbird species on habitats located in the immediate hinterland of the SPA or in areas ecologically connected to it are specifically identified in the SPA Conservation Objectives Supporting Document Version 1 as giving rise to increased levels of disturbance leading to displacement and/or a reduction of the numbers of certain waterbird species⁶. NPWS recommends that assessments should consider ex situ habitats and their significance to the listed bird species.

A similar issue was identified by the Board’s inspector in relation to a nearby application on a site 30-120m from the SPA (Ref 302948, para 7.16.2) which was refused because significant effects on the integrity of the Boyne Estuary SPA could not be ruled out. The lack of assessment of that location as a potential ex-situ site was particularly highlighted by the Inspector.

A further issue arises in the lack of assessment of human activity disturbance on SCI species. The SPA supporting documents identify disturbance from walkers (including with dogs) as an activity with moderate to high disturbance rates. There is no assessment in the application documents of the effect of the proposed development on such types of disturbance. While there is an assessment of vehicular traffic generation there is no assessment of increases of walking (including dog walking) and cycling and the likely disturbance effects on the SPA.

On the basis of the information provided by the developer the Board cannot exclude significant effects on the integrity of the Boyne Estuary SPA and therefore lacks the jurisdiction to grant the permission without further information and further rounds of public participation.

Insofar as the time constraints placed on the Board by domestic law interfere with the Board’s duty to conduct appropriate assessment and EIA, these constraints cannot affect the Board’s EU law obligations and it is entitled to disapply any national law deadlines if it decides to request further information from the developer and/or it engages in further rounds of public participation.

Habitats Directive – Bats

⁶ Boyne Estuary Special Protection Area (site code 4080) – Conservation Objectives Supporting Document Version 1 (NPWS December 2012) Pages 8 and 18

Bats benefit from strict protection under the Habitats Directive which prohibits all forms of deliberate capture or killing of specimens of bats in the wild, deliberate disturbance of these species; and deterioration or destruction of breeding or resting sites.

It seems from the bat assessment presented that there is significant bat activity on the site and that the site is used for feeding. The report also suggests that trees and buildings on the site have bat roosts, that the roost surveying is not comprehensive and that there will be further surveying. The report acknowledges that feeding capacity will be reduced and there is a risk of roost destruction. Mitigation measures are proposed but some of these appear to be compensatory measures (e.g. bat boxes and planting). Some of the mitigation, such as it is, is qualified.

There is no scientific assessment of the efficacy of the proposed mitigation or compensatory measures. Nor is there any scientific basis for the conclusion that the development will have no direct impact on the conservation status of any bat species. It is also clear that the strict protection under Annex IV is aimed at individual specimens and is not intended to be assessed only at the level of conservation status of a species as a whole.

It would therefore be unlawful to grant permission based on the developer's bat assessment and proposed mitigation/compensatory measures.

EIA Points

The EIAR is undermined by the deficiencies identified in the TTIA, the treatment of bats and the Boyne Estuary SPA. It also does not assess the risk to human health from noise and air pollution caused by increased traffic passing through Julianstown.

Zoning/Strategic Environmental Impact Assessment Directive Issues

The Zoning policy referred to by the developer in its application is incorrect since this policy is in an expired development plan (Drogheda Borough Development Plan 2011 to 2017 (as amended)). There is therefore no specific zoning policy for this location.

The application is premature pending the proposed adoption of a Local Area Plan by Louth County Council.

In any event the temporal extension of development plan policies beyond the dates anticipated when the plan was made must be subject to SEA and Appropriate Assessment and in the absence of updated or new assessments the policies cannot be relied on.

Conclusion

The application is deficient in a number of serious aspects and without further information and further public participation permission cannot be lawfully granted.

Figure 1 Julianstown Monthly Volume 2013 to date (31.8.2019) (source: TII)

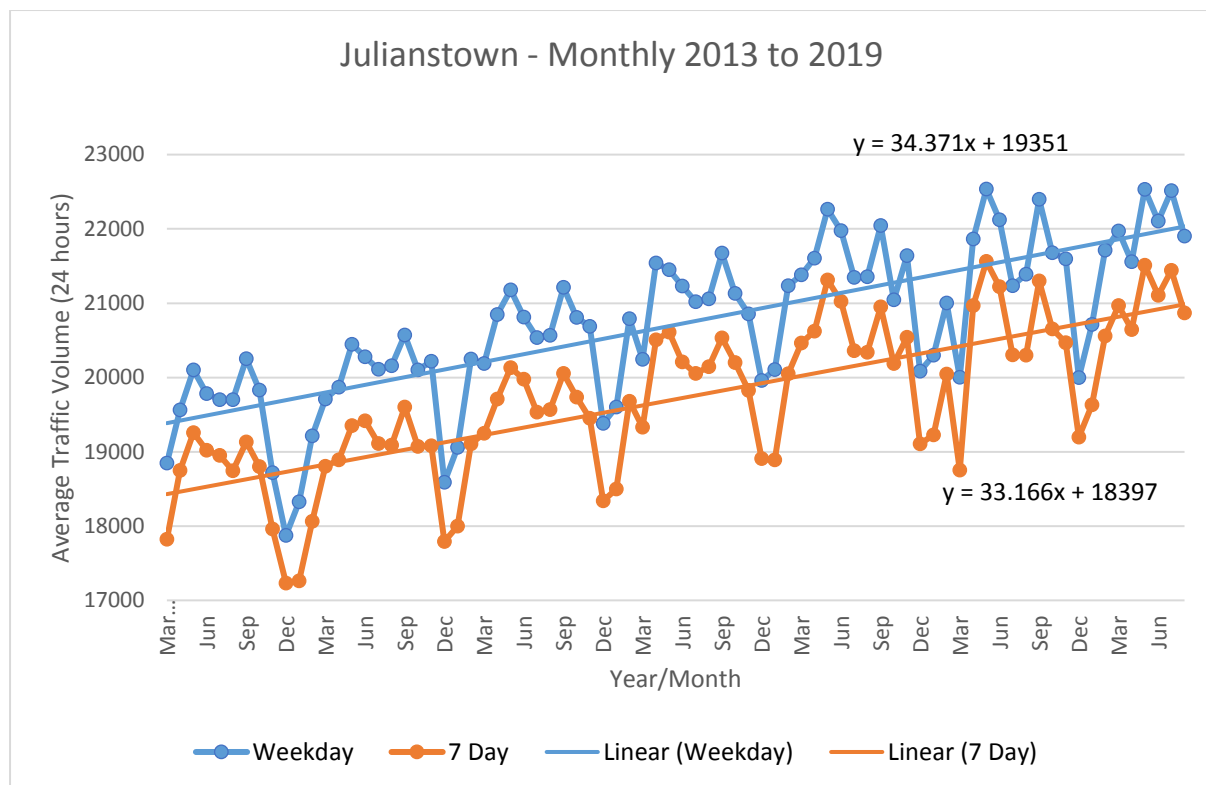


Table 1: Class report – Julianstown 1.1.2018 to 31.8.2019 (Source: TII)

Site Name: TMU R132 090.0 N Site ID: 000000201321 Grid: 313813270049 Description: R132 South of Julianstown, Whitecross, Co. Meath																
Setup: R132 201321 Channel: All directions Show daily: Average Time Period: 1 hour Precision: Normal Exclude data: None																
	Average Flow	MBIKE	CAR	LGV	BUS	HGV_RIG	HGV_ART	CARAVAN	Invalid Reading	%HGV						
00:00	197	0	175	14	1	1	4	0	0	2.9						
01:00	128	0	112	13	0	1	2	0	0	2.4						
02:00	96	0	82	10	0	2	2	0	0	3.8						
03:00	111	0	93	12	0	2	3	0	0	4.2						
04:00	173	0	146	21	1	3	2	1	0	3.1						
05:00	382	1	323	42	3	5	7	1	0	3.2						
06:00	912	3	773	107	6	9	13	1	0	2.4						
07:00	1198	4	1011	135	11	19	15	3	0	2.8						
08:00	1278	3	1100	118	10	22	20	5	0	3.3						
09:00	1061	3	882	113	9	27	23	5	0	4.7						
10:00	960	3	787	109	7	27	22	5	0	5.1						
11:00	1051	3	875	110	7	27	23	5	0	4.8						
12:00	1158	3	986	114	7	24	20	4	0	3.8						
13:00	1272	3	1099	116	8	23	20	4	0	3.4						
14:00	1340	3	1163	116	10	24	19	4	0	3.2						
15:00	1372	3	1187	128	9	23	17	4	0	2.9						
16:00	1490	4	1312	129	10	18	13	4	0	2.1						
17:00	1548	4	1394	119	8	10	10	3	0	1.3						
18:00	1432	4	1305	96	8	7	9	3	0	1.1						
19:00	1135	3	1039	72	6	6	8	2	0	1.2						
20:00	833	2	765	51	4	4	6	1	0	1.2						
21:00	605	1	555	38	4	3	4	1	0	1.1						
22:00	448	1	413	26	2	2	4	0	0	1.3						
23:00	294	1	267	19	2	2	4	0	0	1.8						
07-19	15160	41	13100	1403	103	252	211	49	1	3.1						
06-22	18645	49	16232	1671	123	273	242	54	1	2.8						
06-24	19387	51	16912	1715	127	276	249	55	1	2.7						
00-24	20475	53	17844	1828	132	291	270	56	1	2.7						
am Peak	08:00	07:00	08:00	07:00	07:00	11:00	11:00	09:00	08:00	03:00						
Peak Volume	1278	4	1100	135	11	27	23	5	0	0.0						
pm Peak	17:00	17:00	17:00	16:00	14:00	12:00	13:00	12:00	14:00	12:00						
Peak Volume	1548	4	1394	129	10	24	20	4	0	0.0						

Annex 1 – Meath County Council traffic analysis for Julianstown

Comhairle Chontae na Mí

Halla an Chontae, An Uaimh, Co. na Mí, C15 AW81

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Our Ref: TRA 05 01 04 02

Transportation Department

14th March 2017.

Dominic Mullaney,
Principal Adviser,
Roads Division,
Department of Transport, Tourism & Sport,
25 Clare Street,
Dublin 2,
D02HC42

RE: R132 – Julianstown Village, County Meath

Dear Mr. Mullaney,

I am writing to you to highlight the worsening traffic conditions in Julianstown on the R132. Traffic volume and speed are sources of concern within the village given its location at the nexus of the R132 and the R150.

It is considered that the majority of residents in Drogheda and the coastal strip of Meath enter and exit the M1 Motorway at Junction 7 to the south of Julianstown. The M1 Toll Plazas Scheme was approved by An Bord Pleanála in 2002. The village has not benefitted from the opening of the M1 Motorway to the extent which would have been expected and traffic volumes are considerable in both directions daily. It is noted that the recorded Average Annual Daily Trips on the R132 south of Julianstown is now in the order of 20,000 AADT.

The M1 Toll Plaza Scheme 2001 predicted that the tolled and untolled traffic flows (AADT) on the old N1 north of Gormanston would be 15,955 and 22,765 in 2027 respectively. Using the average traffic growth rate from the TII counter on the R132 at Whitecross between 2013 and 2016, the 22,765 figure above will be exceeded in 2022.

The traffic figures in the M1 Toll Plazas EIS appear to have underestimated traffic growth in Julianstown and we consider these are approaching an unacceptably high level. Furthermore, any future growth of Drogheda and the Laytown & Bettystown areas will further increase the pressure on the roads which pass through the village. The Council believes that it is now imperative that work begins to find a solution to significantly ease traffic volumes to a level that befits a village street.

The current Meath County Development Plan 2013-2019o includes the following policies and objectives in relation to Julianstown:

SP 3 To address traffic problems on the R132 Regional Road through Julianstown.

MA OBJ 1 To investigate the effectiveness of, and if appropriate, progress the implementation of, traffic management and traffic calming options and environmental measures through Julianstown village, in conjunction with the National Roads Authority, Department of Transport, Sport and Tourism and the National Transport Authority with a view to providing an enhanced and safer environment for the village.

The M1 Toll Plazas EIS recommended the introduction of traffic calming measures on the main approach roads to and from the M1 interchanges to reduce speeds and any increases in severance or disruption to community facilities. The Council is proposing to investigate the effectiveness of further traffic management measures in Julianstown in 2017. It will also review its objectives for Julianstown in the course of the review of the County Development Plan 2019-2025 which is now underway.

A preliminary study was carried out in 2015 after a request from Meath County Council to the then NRA to examine the impact of some options aimed at alleviating traffic volumes in Julianstown using existing modelling tools. This included examination of the impact of the proposed distributor road between the R132 and junction 8 on the M1 included in the land use zoning objectives map of the Meath County Development Plan. In addition, two other notional road upgrades were also proposed for the testing of alternative options to relieve traffic through Julianstown. The 3 options considered in the report were as follows:

- Option 1: The distributor road to the south of Drogheda as included in the land use zoning objectives map of the Meath County Development Plan.
- Option 2: A notional local bypass of Julianstown
- Option 3: A notional link from the R150 to a new 'half diamond' interchange on the M1

A note was produced summarising the traffic modelling assessment and this is attached for information. Based on the model tests undertaken and an analysis of traffic impacts, toll revenue impacts and overall network performance, a local bypass of Julianstown (Option 2) emerged as the preferred solution in terms of reducing traffic volumes through the village of Julianstown and minimising impacts on the M1. The modelled impact was that the bypass would reduce the am peak hour traffic by 82% compared to 2% and 25% for options 1 and 3 respectively. The report suggested that a potential next step would be to undertake a design study to shortlist alignment options that are technically feasible.

While the scope to implement major investment programmes in areas such as transport is tightly constrained, the Council is minded to include an objective in the next development plan to provide a local bypass or other roads/measures aimed at reducing or removing through traffic in the village. We recognise that such a solution will require discussion with other agencies such as the Department of Transport, Tourism and Sport. Given the history of the development of the M1 and the subsequent addition of the M1 Toll Plaza Scheme, the Council consider it is also appropriate to discuss the matter with the TII. In January 2017 the Chief Executive of Meath County Council specifically raised the issue of Julianstown with the Minister of Transport, and I am now inviting the DTT&S and the TII to engage in discussions about advancing a solution to deal with the traffic situation. I would therefore be grateful if you would revert to me regarding the above and indicate your willingness to meet with myself and officials from the Council on this matter.

Yours sincerely,



Des Foley
Director of Services Transportation.

Encls: Aecom Technical Note

Project:	NRA Traffic Management & Planning	Job No:	Task 13.4
Subject:	Julianstown Assessment		
Prepared by:	Dan Brennan	Date:	4th March 2015
Checked by:	Philip Shiels	Date:	4th March 2015
Approved by:	Shane Dunny	Date:	4th March 2015

1. Overview

Meath County Council requested that the NRA examine the impact of a proposed east-west distributor road, to the south of Drogheda, on traffic volumes in Julianstown using existing modelling tools. The potential distributor road is included in the land use zoning objectives map of the Meath County Development Plan. In addition, a number of notional road upgrades were also proposed for the testing of alternative options to relieve traffic through Julianstown

This note summarises the traffic modelling assessment of the proposed transport measures within the vicinity of Julianstown, Co. Meath and the M1 National Route.

2. Existing Conditions

Julianstown is situated on the R132 to the south of Drogheda and approximately 4km north of Junction 7 on the M1. The M1 Dublin to Belfast route is tolled within the vicinity of Drogheda with a mainline toll located between Junction 7 and Junction 8 and tolls on the north facing slip roads of Junction 9.

There is currently a high level of traffic demand through Julianstown, with an AADT just below 19,000 vehicles on the R132. This is due to its location as an access route to Laytown and Bettystown and also as an access route to Drogheda. Previous studies by the NRA indicate that there is a low level of toll avoidance on the M1¹. Traffic survey data indicated that approximately 3% of trips between the M1 south of Junction 7 and the M1 north of Junction 11 used the R132 to avoid tolls on the M1.

The R132 is a standard single carriageway road through Julianstown, with a speed limit of 50 kph through the village. The above is summarised on a location map presented in Figure 2.1.

¹ National Roads Traffic Management Strategy Technical Note: M1 Drogheda Slip Tolls, May 2012.



Figure 2.1: Existing traffic flows taken from 2014 NRA counter data

3. Analysis Tools

A local traffic model was developed by the NRA in 2012 to examine the impact of tolling options on the M1 on Drogheda and its environs. It was proposed that this model be used for the Julianstown assessment.

The model is a 2011 AM peak (08:00-09:00) VISUM traffic model of the study area shown in Figure 3.1.



Figure 3.1: M1 Drogheda Tolling Study – modelled area

An initial comparison of current traffic flows at key NRA count sites, from November 2014, in the local area with modelled flows was undertaken and is presented in Table 3.1.

Table 3.1: Comparison of November 2013 Traffic Counts with 2011 VISUM model flows (08:00-09:00)

Location	Northbound			Southbound		
	Count	Modelled	GEH	Count	Modelled	GEH
R132 Julianstown	642	566	3.1	1,019	985	1.1
M1 between Jn7 and Jn8	781	679	3.8	1,265	1,353	2.4

Based on the above comparison, it was determined that the M1 Drogheda Tolling Study model was appropriate for use in the Julianstown assessment.

4. Options Considered

An initial test was undertaken on the impact of a distributor road to the south of Drogheda as included in the land use zoning objectives map of the Meath County Development Plan. This option is referred to as Option 1 and an indicative alignment is shown in Figure 4.1.

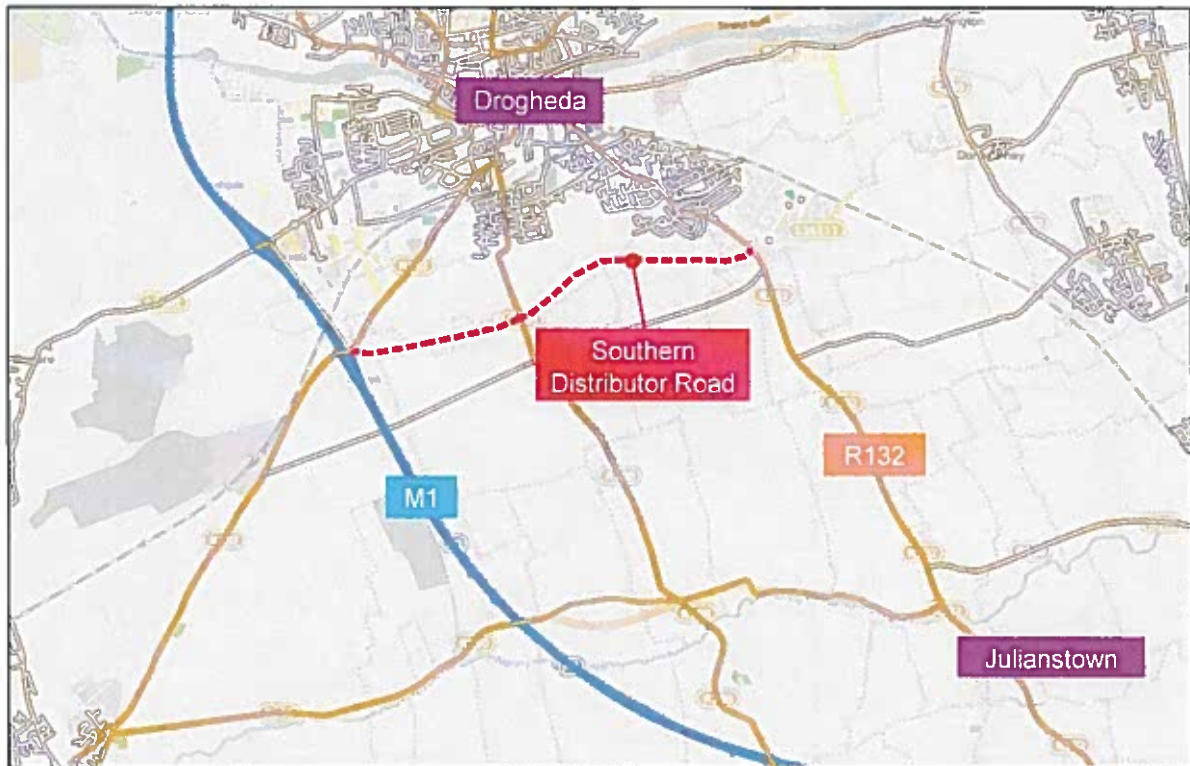


Figure 4.1: Option 1 - Indicative alignment of Drogheda Southern Distributor Road

Further tests were considered as follows:

- Option 2: A notional local bypass of Julianstown
- Option 3: A notional link from the R150 to a new 'half diamond' interchange on the M1

Indicative alignments of these options are presented in Figure 4.2 and 4.3. For all options, the new link roads were assumed to be standard single carriageway regional roads.



Figure 4.2: Option 2 – A notional local bypass of Julianstown



Figure 4.3: Option 3 – A notional link from the R150 to a new 'half diamond' interchange on the M1

5. Options Assessment

Traffic Impacts

In order to estimate the impacts of the proposals, all options were coded into base year 'Do Something' scenarios. Initially the impacts of each option on base year AM peak modelled traffic volumes on the R132 at Julianstown was assessed. The results of this assessment are presented in Table 4.1.

Table 4.1: Modelled AM peak traffic impacts in Julianstown

Location	Base	Option 1	Option 2	Option 3
R132 Julianstown	1,551	1,525	284	1,170
% difference	-	-2%	-82%	-25%

The proposed Drogheda SDR (Option 1) has minimal impacts on traffic volumes through Julianstown. This route is forecast have more local impacts on adjacent routes such as the R152 and R108, under existing traffic conditions. The impacts are demonstrated by means of a difference plot of the VISUM model scenarios presented in Figure 3.1 where increases in traffic are shown in green and decreases in traffic in red.

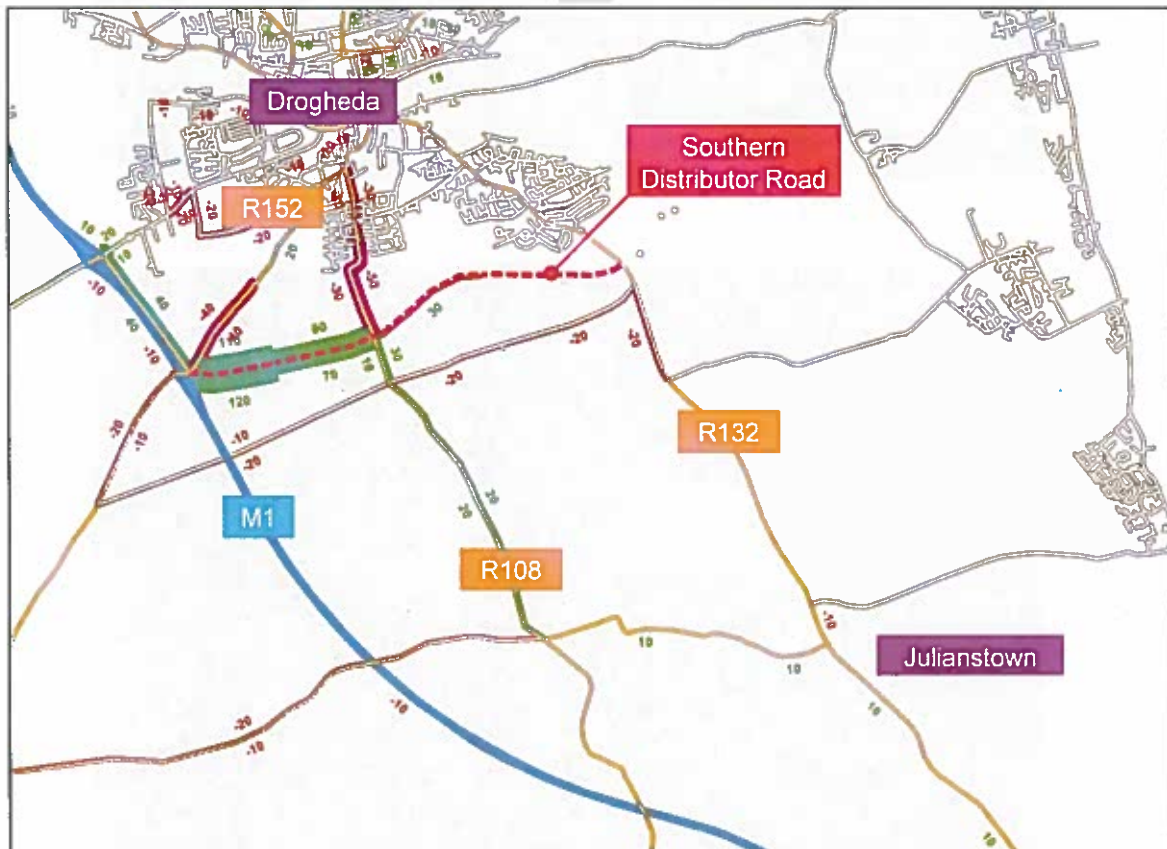


Figure 3.1: AM peak difference plot of Option 1 scenario less Base scenario

The option with the most significant reductions in modelled traffic flows is the local bypass (Option 2) which removes the majority of traffic from the existing R132 through Julianstown. The impacts are demonstrated by means of a difference plot presented in Figure 3.2.

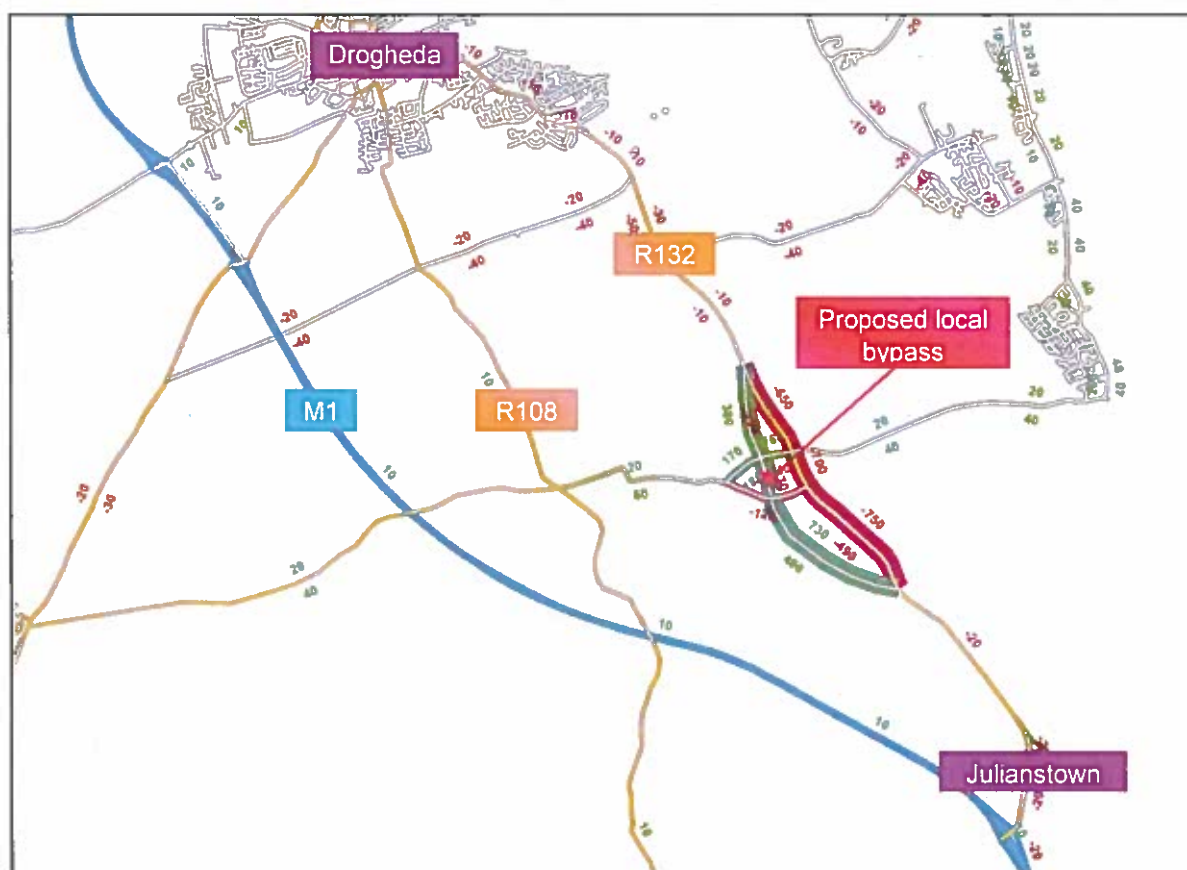


Figure 3.2: AM peak difference plot of Option 2 scenario less Base scenario

Option 3, which involves a new connection to the M1, is forecast to provide some relief to Julianstown, but not to the same extent as Option 2. Further detailed of the impacts of Option 3 are discussed below.

Toll Revenue Impacts

It was also necessary to estimate the impact of the potential options on annual toll revenue on the M1. Factors from AM peak to AADT traffic flow were derived from regression analysis of nearby NRA counter data as per the methodology outlined in NRA PAG Unit 16 'Data Analysis Techniques'. The modelled estimates of annual revenue at the M1 tolls are presented in Table 4.1.

Table 4.2: Modelled revenue impacts at M1 toll plazas (mainline & Jn slip tolls combined)

Location	Base	Option 1	Option 2	Option 3
AM Peak Traffic Flow	2,330	2,333	2,337	2,211
AADT	72,066	72,145	72,315	68,341
Annual Revenue Estimate	€26.3m	€26.3m	€26.4m	€24.9m
% difference	-	+0.1%	+0.3%	-5.2%

The model results indicate that the SDR (Option 1) and proposed local bypass of Julianstown (Option 2) will have negligible impacts on M1 toll revenue. The provision of a new interchange on the M1 and link road to Julianstown (Option 3) is forecast to reduce toll revenue by approximately 5%. This is due to the creation of a more attractive toll avoidance route between the M1 and south of Drogheda. This is demonstrated by the difference plot from the VISUM model presented in Figure 3.3.

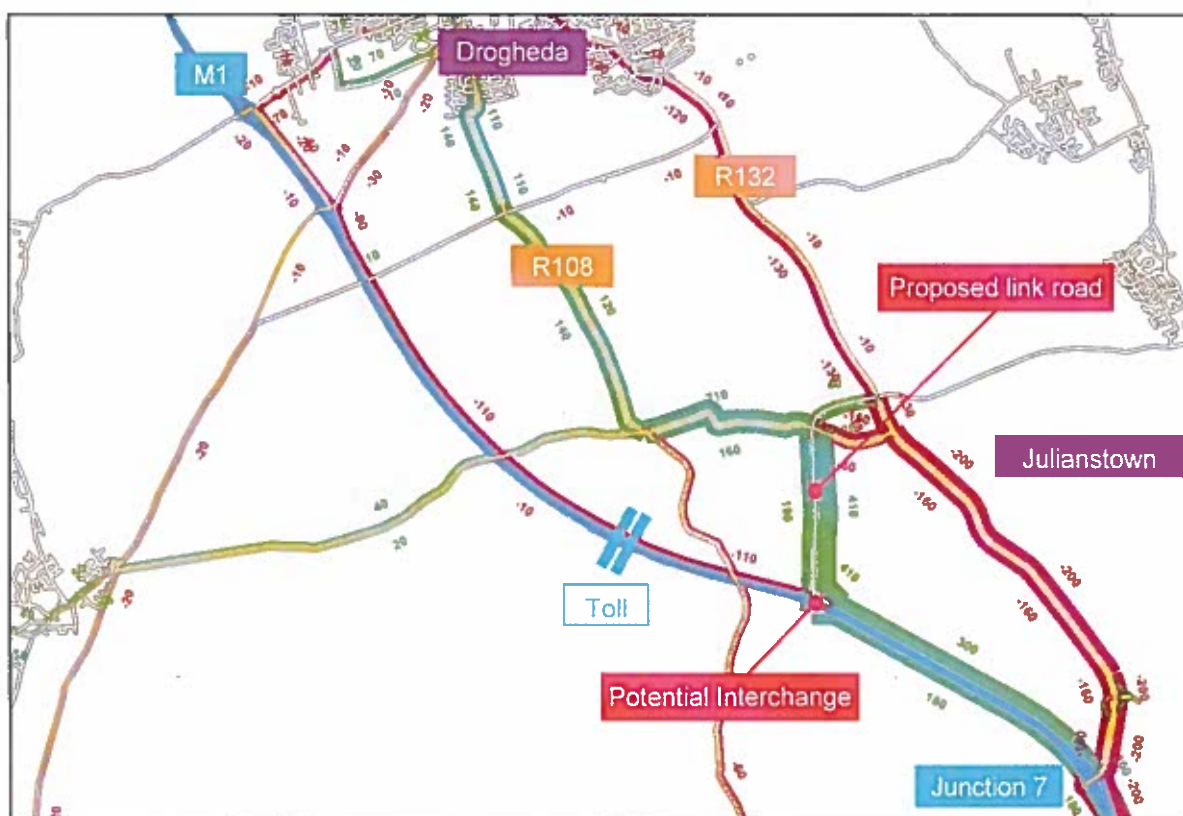


Figure 3.3: AM peak difference plot of Option 3 scenario less Base scenario

The difference plot above compares the Option 3 scenario against the Base scenario and shows increases in traffic in green and decreases in traffic in red. With a proposed new interchange to the north of Junction 7, a new access route to the M1 emerges between the proposed new interchange and link road, via the existing R108, and the south of Drogheda. This is forecast to result in a reduction in traffic through the mainline toll plaza on the M1 and hence a reduction in revenue.

Network Performance Impacts

A further check on the overall modelled performance of the road network was undertaken and is presented in Table 4.3.

Table 4.3: AM peak traffic model network statistics

Location	Base	Option 1	Option 2	Option 3
Total Travel Distance (km)	874,517	874,945	870,506	870,789
Total Travel Time (hours)	15,348	15,301	15,230	15,199

The statistics show that all options provide benefits in terms of travel time and distance savings, with Options 2 and 3 providing the most significant benefits.

6. Conclusion

Based on the model tests undertaken and an analysis of traffic impacts, toll revenue impacts and overall network performance, a local bypass of Julianstown (Option 2) emerges as a preferred solution in terms of reducing traffic volumes through the village of Julianstown and minimising impacts on the M1. A potential next step would be to undertake a design study to shortlist alignment options that are technically feasible.

Annex 2 Julianstown R132 Preliminary Business Case

Julianstown R132

Preliminary Business Case

Prepared for: Meath County Council

Date: December 2018

Prepared for:

Meath County Council as a '*Preliminary Business Case*' for the R132 Julianstown Traffic Alleviation Project. This report is compliant with Common Appraisal Framework standards and Circular RW 06/2018,

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Quality Information

Revision History

Table QI.1: Revision History

Revision	Revision Date	Details	Name	Positions
V.01	20/12/2018	Draft	Catherine Murray	Associate Director
V.02	21/12/2018	Draft	Catherine Murray	Associate Director

Quality Control

Table QI.2: Quality Control

Prepared By:	Checked By:	Approved By:
-	-	-
Catherine Murray	Philip Shiels	Shane Dunny

Executive Summary

Executive Summary

This report presents the '*Preliminary Business Case*' for the proposed Julianstown Bypass and satisfies the Stage 1 Pre-Appraisal/Preliminary Appraisal requirements of the DTTaS Common Appraisal Framework (2016). The purpose of investing in a relief road is to:

- Alleviate the impact of high level traffic demand travelling through Julianstown village, which currently has an Average Annual Daily Traffic (AADT) count of over 20,000 vehicles
- Improve safety conditions for all road users, but particularly for active modes of transport (pedestrians and cyclists) and mobility within the village
- Contribute to health benefits, with reductions in air pollution, vibration and noise
- Reduce journey time on the R132, thereby increasing journey time reliability
- Improve resilience of the transport network in north-east Meath, given the likely increased future demand on transport networks.

A bypass was not the only solution explored in this analysis. Four solutions or options were assessed, along with a 'do nothing' scenario;

- Option 1: a 'do nothing', or baseline scenario/option
- Option 2: east-west distributor road to the south of Drogheda
- Option 3: local bypass of Julianstown
- Option 4: new link road from the M1 to the R132 north of Julianstown
- Option 5: investment in other transport modes.

It should be noted that this preliminary business case relies on traffic modelling that AECOM undertook in 2015 following a request from Meath County Council to examine the impact of potential solutions to the traffic volumes in Julianstown. Should the scheme progress an update of the traffic modelling task will likely be required. Our analysis suggests that there is a *prima facie* case for 'doing something' to address the traffic volumes in Julianstown, with positive benefit to cost ratios for all the road construction options, ranging from a low estimate of 1.56 when calculated for 30 years of the road's life to the highest estimate of BCR value of 5.8 for one of the Options, when calculated for 60 years of benefits. These benefits are described as preliminary, taking into account time savings only, and therefore can be considered very conservative.

Option 3, the bypass of Julianstown emerged as the preferred option in both the Multi-criteria Analysis and preliminary cost benefit analysis, although it should be noted that the public transport investment option was not fully costed at this time.

Table 1. Summary of Preliminary Multi-criteria Analysis and Cost Benefit Ratio Results

		Options/Scenario				
Category	Criteria Description	I	II	III	IV	V
Economy	Transport Efficiency and Effectiveness: Reducing journey times	2	5	7	5	4
	Wider Economic Impacts: Reducing transport costs	3	5	5	5	4
	Transport Reliability and Quality: Improving congestion	3	5	5	5	5
Safety	Collision Reduction: Road Safety Authority guidelines	4	5	5	4	4
	Security: Removing safety issues for all road users	3	4	7	5	5
Environment	Air Quality: Removes emissions from urban environment	3	5	5	4	5
	Noise and Vibration: Removes noise and vibrations from Village.	2	4	7	5	4
	Landscape and Visual Quality:	3	4	5	4	4
	Biodiversity: Natura 2000 sites, particular habitats.	4	4	4	4	4
	Cultural, Archaeological, Architectural Heritage:	2	4	6	4	4
	Land Use: Impact upon existing land uses	4	3	3	3	3
	Water Resources: Effect on water courses	4	4	4	4	4
	Accessibility & social inclusion	Vulnerable Groups: access to schools	3	4	6	5
Deprived Geographical Area: n/a		4	4	4	4	4
Integration	Transport Objectives: Strategic Connectivity	2	4	3	4	5
	Land Use Integration: Local planning objectives	3	4	5	5	7
	Geographic Integration: Enhanced regional accessibility	3	4	4	4	7
	Integration with other Government policies: Compatibility with wider policy	4	4	5	4	4
Physical Activity	Opportunities for pedestrian and cyclists	3	4	5	5	5
Benefit to Cost Ratio	30 Year Appraisal		1.56	3.9	3.35	Not
	60 Year Appraisal		2.25	5.8	4.28	calculated

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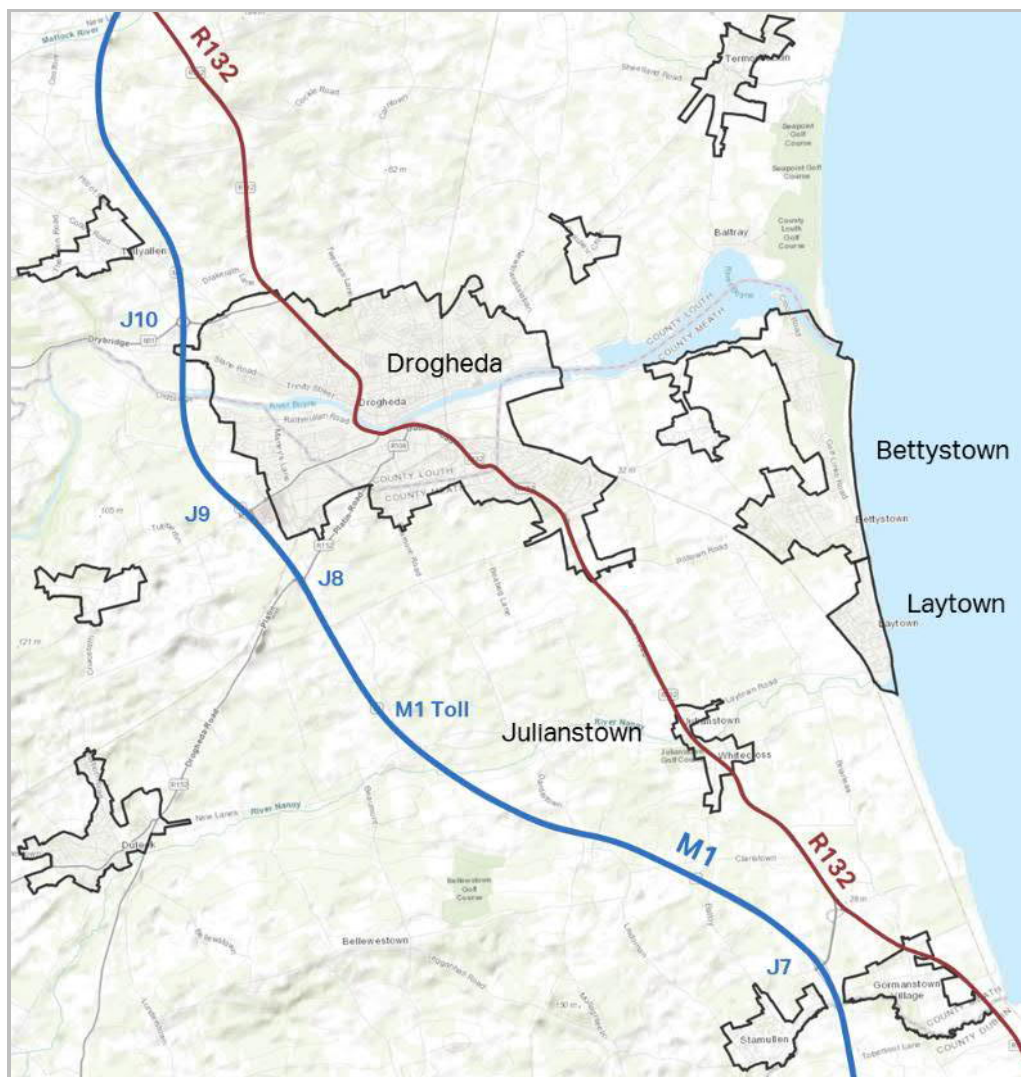
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1. Introduction

Meath County Council wants to resolve the issues arising from high traffic volumes in Julianstown village, to the north east of the county. The Council is determining whether a sufficiently good prima facie case exists for considering a relief road around the village, which emerged as a preferred option in earlier analysis.

A Stage 1 – Preliminary Appraisal of alternative options is required to aid the decision. This involves using multi-criteria to analyse alternative options, as set out in the Public Spending Code and Common Appraisal Framework. We assume the cost of the project is between €5million and €20 million. Note this is an indicative initial project cost range, as no detailed design nor confirmed routes have been selected.

Figure 1. Julianstown and nearby settlements of Laytown, Bettystown and Drogheda



In the Meath County Development Plan (2013- 2019), Julianstown is classed as a commuter village due to its proximity to the large employment areas in Dublin, or other growth town. The following relevant Objectives and Policies specifically addressing transport and mobility in Julianstown are:

- Cultural Heritage OBJ 25 - To support proposals from local communities and community organisations which seek to have a Village Design Statement for a particular village drawn up through a process involving community participation, the Heritage Council and the Council's Planning Department, subject to availability of resources.
- Strategic Policy 1 - To promote the future development of the village as a compact settlement with a pedestrian friendly environment, a legible and coherent physical form, and a variety of land uses and amenities.
- Strategic Policy 3 - To address traffic problems on the R132 Regional Road through Julianstown.
- Movement and Access OBJ 1 – To investigate the effectiveness of, and if appropriate, progress the implementation of, traffic management and traffic calming options and environmental measures through Julianstown village in conjunction with the National Road Authority with a view to providing an enhanced and safer environment for the village.
- Movement and Access OBJ 2 - To improve linkages along the R150 between Julianstown and Laytown including investigating the improvement of cyclist and pedestrian connectivity and facilities between both centres.
- Movement and Access OBJ 3 - To improve linkages along the R132 between Julianstown and Drogheda.
- Movement and Access Pol 1 – To require the provision of short-term on-street vehicle parking where appropriate.

1.1. Background

With a population of 681 people, Julianstown has two main residential estates - Preston Park estate to the north of the village and Ballygarth estate to the south of the village. Whitecross National School is the one primary school, with 450 students. It is located along the R132, to the south of the village. Julianstown has an active voluntary Julianstown & District Community Association. It is a democratically elected representative community organisation, that maintains the village and its environs, governs a village community garden and organising social events. Julianstown village is a designated Architectural Conservation Area, within Volume I of the County Development Plan 2013-2019. The village was chosen by the Heritage Council and Meath County Council as the rural Pilot Project for the national Village Design Statement Programme in 2008. Julianstown has historical and natural heritage, with the river Nanny Estuary and Shore Special Protection Area designated a Natura 2000 site beginning 1 km east of the Village.



1.2. Traffic Volumes in Julianstown

High traffic volumes pass through the R132 at Julianstown on a daily basis. With a population of only 681 people, the Average Annual Daily Traffic (AADT) count of 20,472 in 2018 is high for the size of the village. It is unsurprising, as Julianstown along with Laytown, Bettystown and Drogheda are popular for commuting to Dublin. They form the northern end of “Corridor A”, in the Transport Strategy for the Greater Dublin Area 2016-2035. The car mode share for all trip purposes in this corridor is 72 per cent, with public transport at 12 per cent.

Drogheda, County Louth, is the largest town in Ireland, with a population of 40,956 in 2016. Transport demand pressures are increasing. There is a significant amount of population and employment growth planned for south Drogheda, and overall, this corridor between Drogheda to Dublin city centre (including Balbriggan, Swords and North inner-city Dublin) is forecast as having the highest growth in transport demand up to 2025.¹

The R132 passes through Julianstown, meeting Junction 7 on the M1 approximately 4km south of the village. The R150 traverses the R132 in Julianstown – linking eastward-westward traffic from Duleek (approximately 10km west of the village) to the coastal towns of Bettystown and Laytown.

Increased traffic volume in Julianstown resulted from population growth and the location of the toll booth on the M1 (between Junctions 7 and 8), which opened in 2003. The M1 has taken considerable traffic away from Drogheda Town Centre for through traffic, but the location of the toll booth did not reroute the potential number of vehicles for Drogheda town centre trips. Up to 80 per cent choose to travel via the R132 instead of routing via Junction 8 or 9 where they would pay a toll. Historically, this was the main route south from Drogheda

Average Annual Daily Traffic (AADT) peaked at over 24,666 vehicles in 2002. This fell to 18,946 vehicles in 2004, a drop that can be attributed to the opening of the Dunleer to Dundalk section of the M1 in 2001, and the Drogheda Bypass section of the M1 in 2003. Following the Global Financial Crisis in 2008, a dip in the volumes of traffic is evident, but as the economy rebounded, the traffic volumes have increased to 2005 levels again, with an AADT value of 20,472 for 2018.

¹ NTA, Transport Strategy for the Greater Dublin Area, 2016-2035

Overall, between 2004 and 2018, traffic volume travelling through Julianstown village has been relative static, although the volume observed passing through the M1 toll (between Junctions 7 and 8, north east of Julianstown) during that same period has increased dramatically (Figure 1.1). This demonstrates that the M1 mainline is accommodating the strategic traffic growth across the region. The use of the R132 has remained relatively static as it provides local access to Duleek, Bettystown, Laytown and South Drogheda, accommodating local growth in these areas.

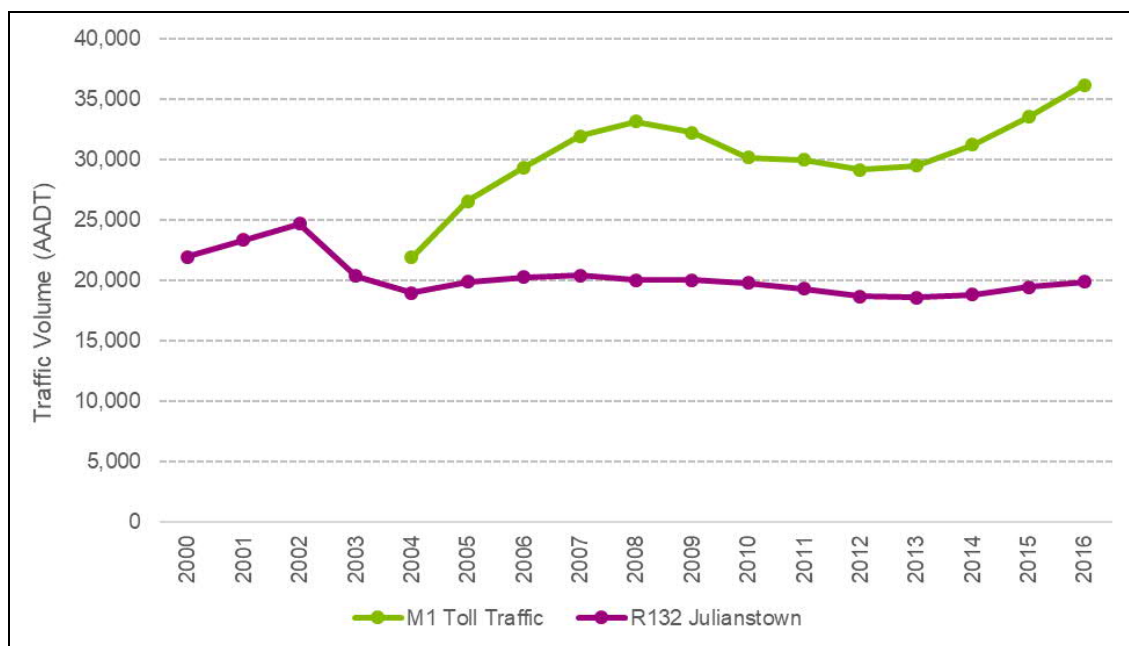


Figure 1.1 Julianstown R132 Average Annual Daily Traffic count and M1 Toll Traffic Data

The volume remains problematic for Julianstown. The R132 is a standard carriageway, with a speed limit of 50km through the village. The staggered crossing of the R150 across the R132 results in significant traffic delays as vehicles travel from eastward to westward direction. The average weekday traffic profile shows total morning and evening peak traffic at 1,600 vehicles per hour. The inter-peak volume is above 1,000 vehicles per hour, indicating constant high volumes of daytime traffic (Figure 1.2). Arguably, the R132 is not fit for purpose, given the large volumes of daily traffic.²

² Transport Infrastructure Ireland, Design Manual for Roads and Bridges.

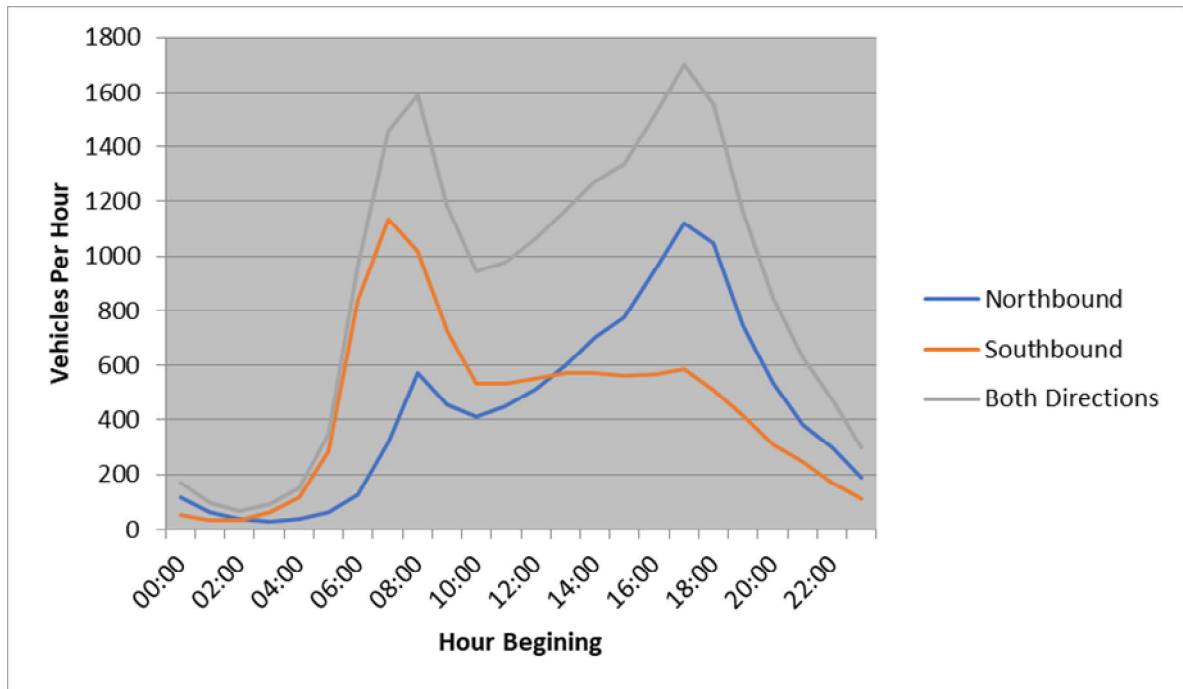


Figure 2.2 Julianstown Average Weekday Traffic Profile

The morning traffic profile is shown on Figures 1.3 and Figure 1.4, showing the direction of vehicles at two junctions, linking the R132 to Bettystown and to Laytown, showing the southerly direction that vehicles travel. Figure 1.4 shows the cumulative vehicle count for southbound traffic between 8 and 9am, the morning peak time in 2018.

Figure 1.3: Southbound morning peak vehicle flow

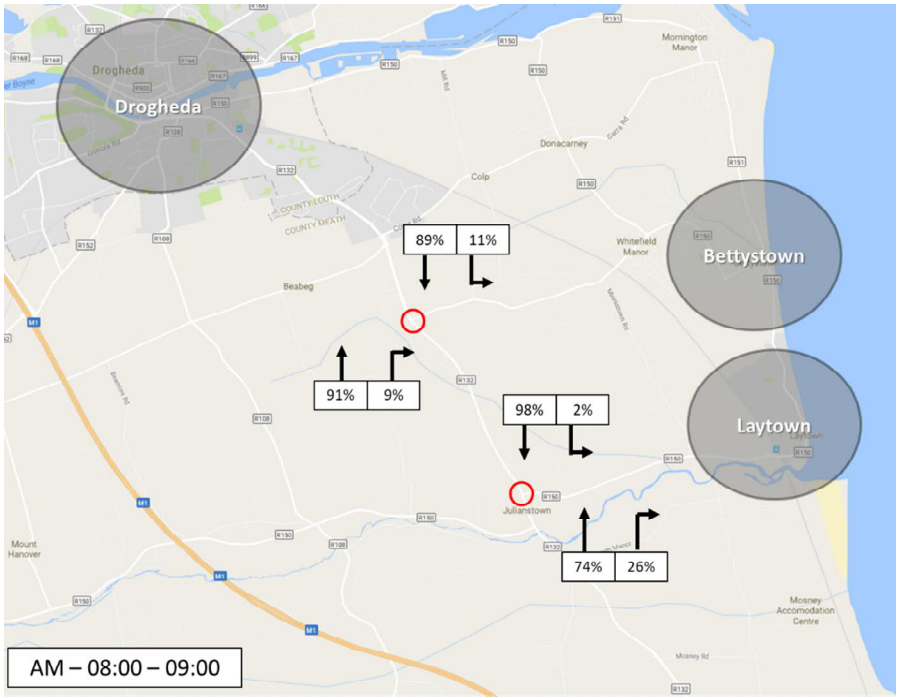
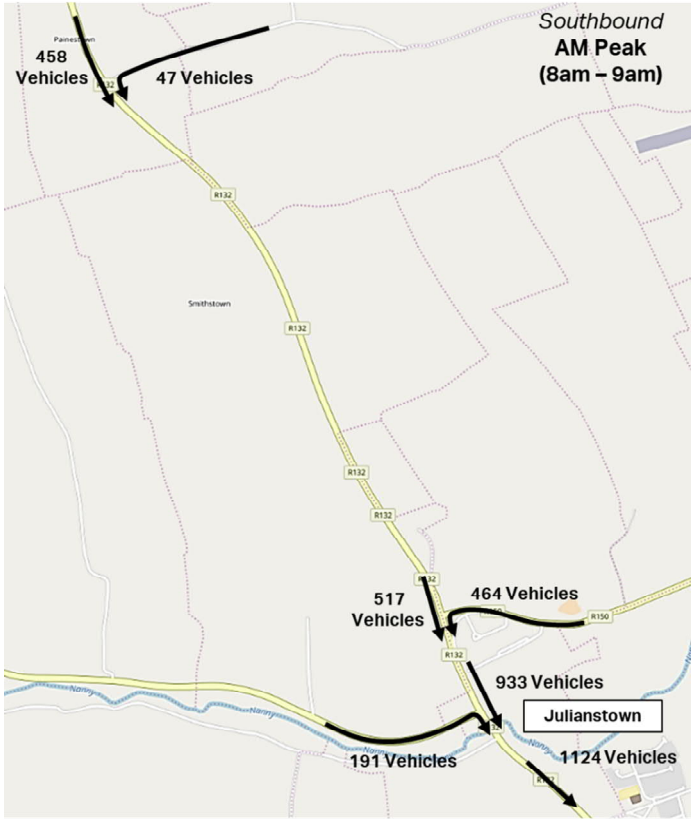


Figure 1.3: Southbound morning peak vehicle flow



Source Google, 2018

1.3. Objectives

Meath County Council wants to alleviate issues arising from high traffic volumes in Julianstown, which is suffering from noise, pollution and congestion. The preferred option also needs to:

- reduce journey time on the R132, thereby increasing journey time reliability;
- improve safety conditions for all road users, but particularly for active modes of transport (pedestrians and cyclists);
- contribute to health benefits, with reductions in air pollution, vibration and noise in Julianstown Village;
- improve resilience of transport network in north-east Meath and south Louth, given increased future demand on transport networks.

Several studies, technical reports and traffic modelling were completed between 2012 and 2018, identifying various options for relieving the traffic demand in Julianstown. These included:

Julianstown Assessment Technical Note for the NRA Traffic Management & Planning (AECOM, 2015)

M1 Junction 9 Slip Road Tolling Study Technical Note: (Roughan & O'Donovan and AECOM, 2012)

R132 Julianstown Assessment Technical Note (AECOM, 2017)

Technical Note 2 – M1 Junction 9 Toll Slips Review (AECOM, 201)

This report uses the traffic demand modelling undertaken in the above studies to assess the various options for relieving the traffic demand in Julianstown. This forms a preliminary assessment of Stage 1 Pre-Appraisal/Preliminary Appraisal requirements, of the DTTaS Common Appraisal Framework.

AECOM have not costed the proposed solutions in detail. Indicative construction costs based on historic costs (with a 25 per cent inflation allowance) for the options are used as estimates, given no detailed design is available at this stage. Several assumptions are made, to undertake this analysis.

2. Methodology & Assumptions

This section discusses the Options appraised, the rationale for their selection and the sources that were used to assess each Option. Traffic flows were modelled, using a Local Area Model, to see the effects of different options on traffic volumes in the AECOM 2015 study. This section elaborates on these options, noting that a local bypass of Julianstown emerged as the preferred options in these previous assessments. This preliminary assessment considers alternative modes of transport to alleviate the traffic volumes, but suggests that increased public transport will not achieve the objectives set out in 1.3. However, we do consider that a public transport option should be included in a more detailed appraisal, as this study did not include any public transport modelling component.

2.1. Options

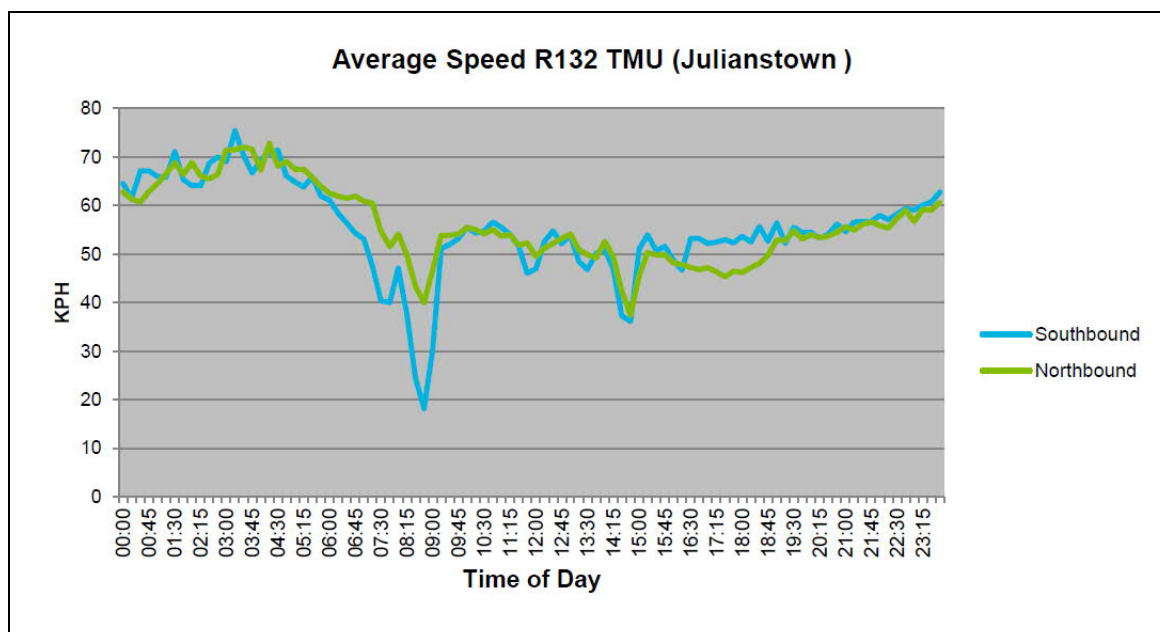
Five Options were selected for appraisal, including a 'do nothing' option. These are described below, with accompanying assumptions.

2.1.1. Option 1. 'Do Nothing'

The 'Do Nothing' option will not improve the traffic demand in Julianstown, with AADT levels at 20,472 and forecast to increase given the capacity for future development in the South Drogheda area. The R132 is the most direct and fastest route to the M1 for residents of southeast Drogheda and residents of Bettystown and Laytown. The population of this area has almost doubled since 2002. Current Census data shows that a significant portion of the additional residents in these areas now commute to the Dublin metropolitan area. The R132 is a rational choice for travel between these areas and Dublin.

The impact of school drop-offs, in combination with peak commuting traffic was assessed between the R132/R150 junction and the R132/Mosney Road junction (in AECOM Technical Note, November 2017). A comparison of journey times on this stretch of the R132 is shown in Figure 2.1. These observations indicate that journey times can increase by as much as 1 minute and 45 seconds during peak times on this 2.6km section of road.

Figure 2.1 Average daily speed of Julianstown traffic over 24 hours



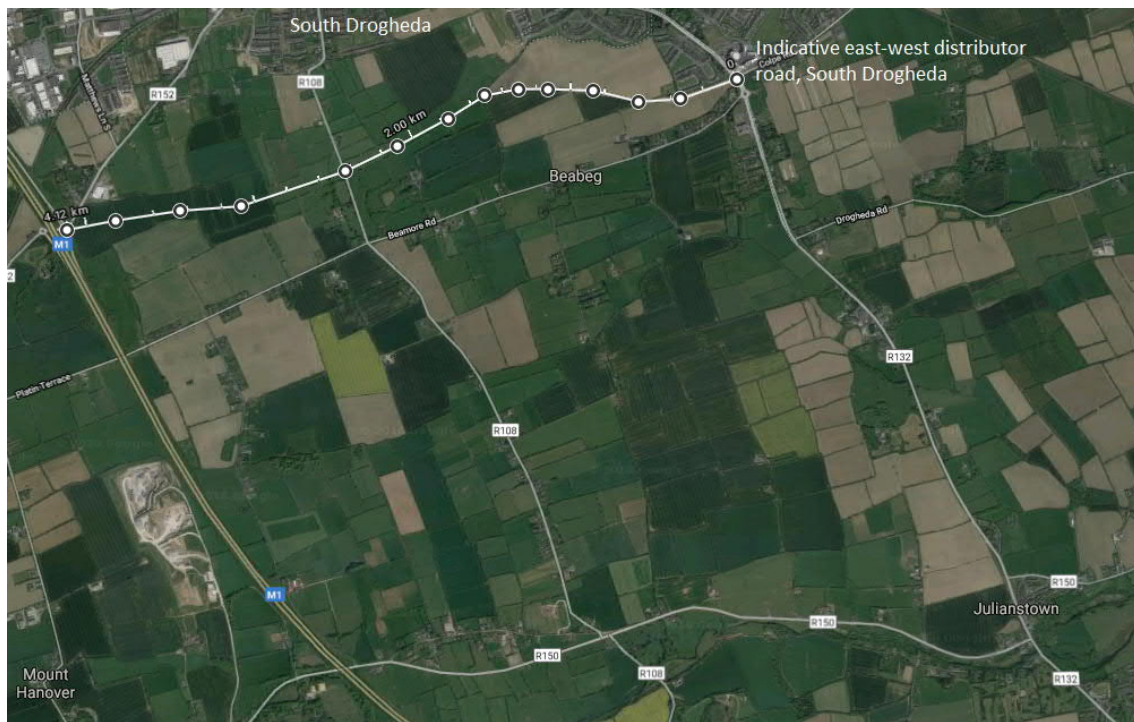
It is noted that planned investment will continue in the 'do nothing' scenario, including design changes in the village itself, and electrification of the northern commuter line from the existing end of the DART network in Malahide on to Drogheda. The passenger load of the combined Drogheda, Bettystown and Laytown stations are estimated to increase to 1,900 by 2033 when the DART electrification is complete. The number of passengers boarding at Drogheda is expected to increase from 1,700 to 2,400. Despite offering more capacity on public transport, there is a significant amount of population and employment growth planned for south Drogheda, and overall, a 'do nothing' approach will likely see the traffic through Julianstown increase.

2.1.2. Option 2. East-west distributor road to the south of Drogheda

An indicative alignment for a standard single carriageway regional road is given in Figure 2.2. This is a 4.12km distributor road, intended to take traffic from South Drogheda to the M1. This was selected in the AECOM 2015 study, as it was included in the land use zoning objectives map of the Meath County Development Plan. We assumed that the new distributor road would be single carriageway. We used indicative construction and land costs, based on previous scheme construction costs estimates and previous scheme land and property cost estimates for a distributor road in the Greater Dublin area, but stress that a more considered appraisal of the actual costs should be undertaken in ensuing appraisals at later Stages.

The indicative figures used for land is €0.92 million per km of road built, and construction costs are €3.36 million per km of single carriage road constructed. We assumed an annual maintenance cost of €20,000 per km of new road after construction. The timeframe chosen to measure benefits of the investment was 60 years, discounted at 5 per cent per annum as per the Public Spending Code.

Figure 2.2 Indicative east-west distributor road, South Drogheda



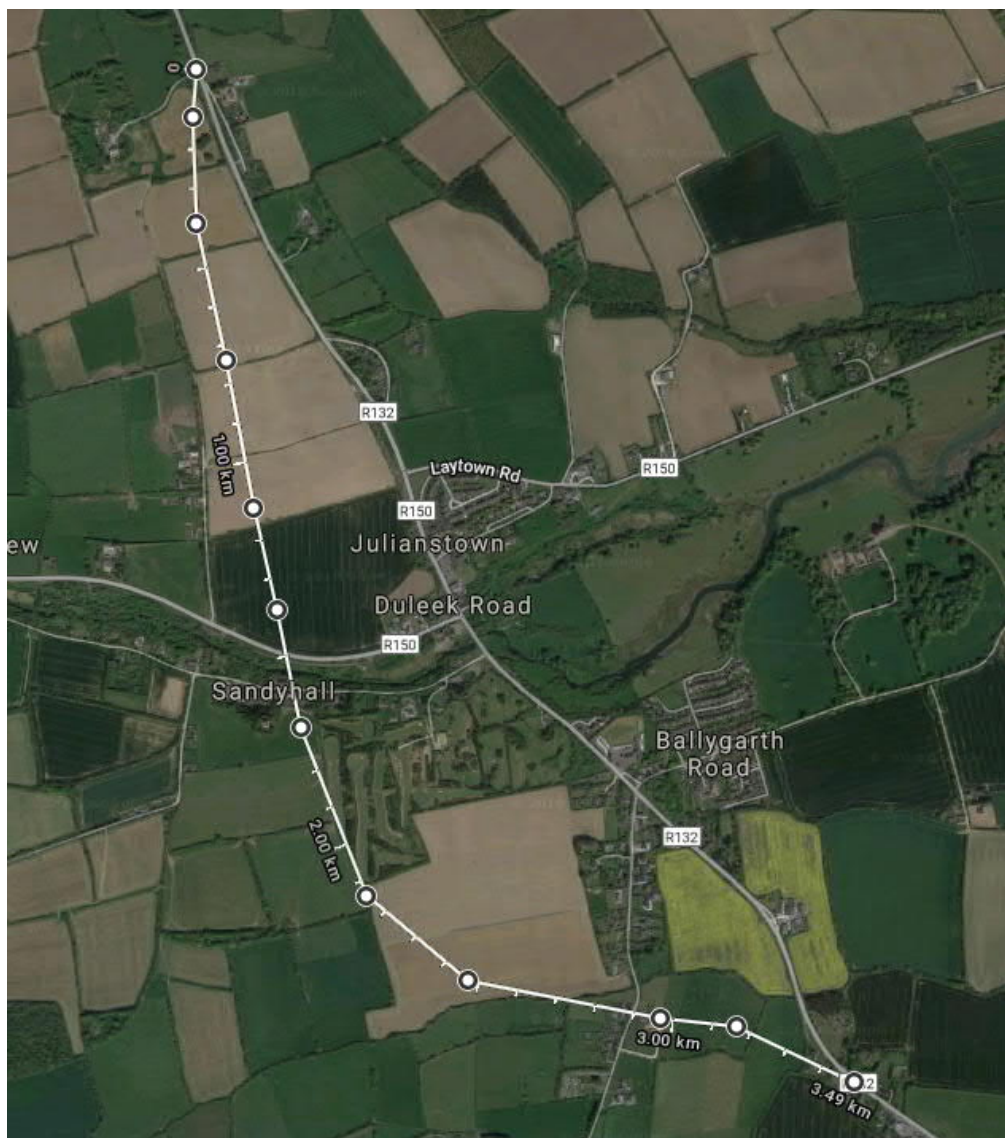
The traffic modelling undertaken to assess this scenario showed a displacement effect of traffic from the existing Junction via the R152 to the new south Drogheda distributor road. There was no change on traffic volumes through Julianstown, and minimal effects on total vehicle-km travelled and time spent travelling (drops of 0.05% and 0.31% respectively). A very small positive impact on M1 Tolls (between Junctions 6 and 8) resulted, an annual increase of 0.1 per cent.

As the South Drogheda distributor road does not alleviate the traffic volumes in Julianstown, it is suggested that it should not be considered further, for more detailed appraisal.

2.1.3. Option 3. Bypass of Julianstown

An indicative alignment for a standard single carriageway regional road is given in Figure 2.3. Arguably, given the current traffic volumes in Julianstown, a dual carriageway option should be explored in future appraisal, and the location and interaction with the R150 Laytown road should be given further consideration. This indicative road reduces the majority of traffic from the existing R132 through Julianstown. Modelled AM peak traffic fell from 1,525 vehicles per hour in the base or 'do nothing' scenario to 284 vehicles per hour. This is a reduction of 82 per cent of the traffic volume through Julianstown.

Figure 2.3 Indicative Bypass of Julianstown

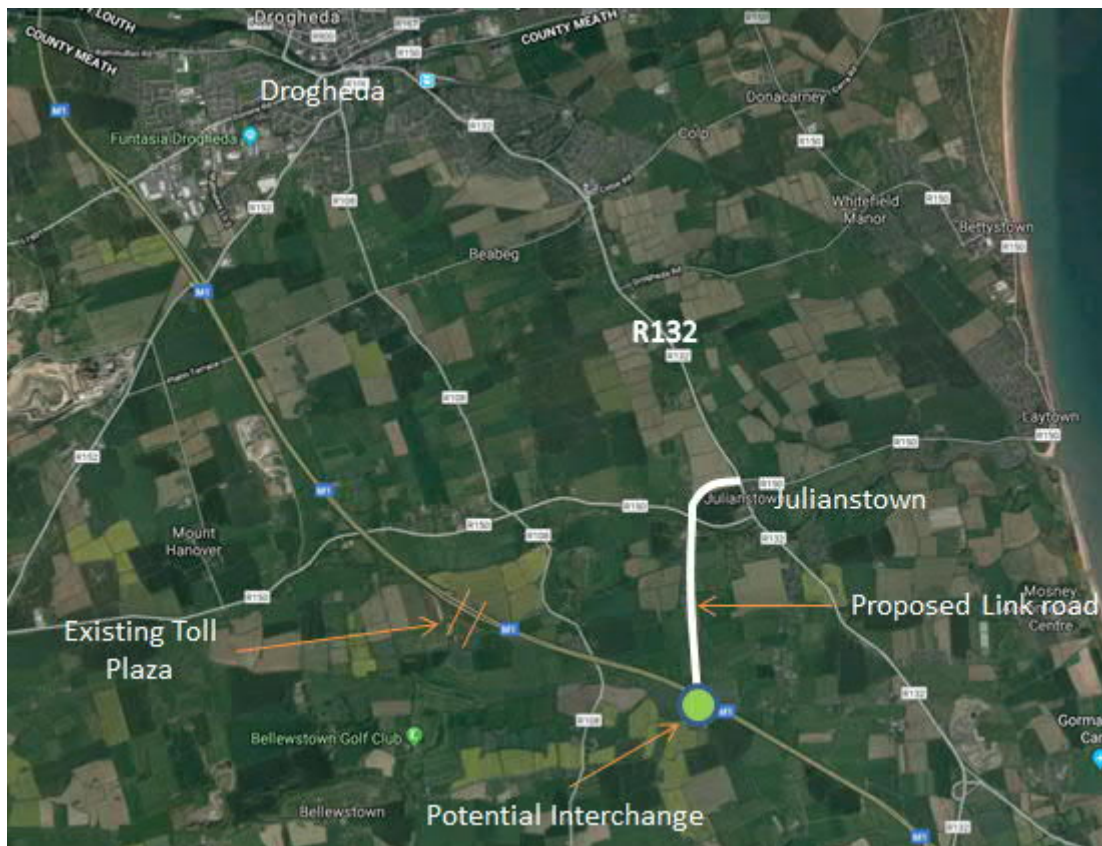


As per Option 2, the same indicative figures land and construction cost figures were used: land is €0.92 million per km of road built, and construction costs are €3.36 million per km of single carriage road. We assumed an annual maintenance cost of €20,000 per km of new road after construction. The timeframe chosen to measure benefits of the investment was 60 years, discounted at 5 per cent per annum as per the Public Spending Code.

2.1.4. Option 4. New Link road from the M1 (north of Junction 7)

The third new road solution for Julianstown traffic that was considered was a Link road, extending from the R150 Laytown junction (at north end of Julianstown) to the M1. This would require a new connection on the M1, and is estimated to be 2.18km in length.

Figure 2.4 Link road with new interchange on the M1



Modelling suggested that this road would take 25 per cent of Julianstown through traffic only. It would also have a displacement effect on M1 traffic, with an increase usage of this road as a route to Drogheda, enabling the avoidance of tolls at the current location of the Plaza between junctions 7 and 8.

2.1.5. Option 5. Invest in other modes of transport

The assessments undertaken by AECOM for TII and the NTA to date were focused on road solutions to the traffic volumes in Julianstown. After calculating the cost of constructing the bypass – the preferred option in the previous studies – the option of investing that level of expenditure into public transport was explored. This was an iterative process, with the option qualitatively constructed after the costs for the three road construction options were undertaken. Note, no transport model was used for this Option analysis, and the scenario is built upon existing transport mode patterns and information available on modal shift patterns.

Drogheda and Julianstown are serviced by the Route 101 Bus Eireann bus service, with approximately 40 buses servicing the route per day. The route operates every 20 – 30 minutes from Drogheda bus station to Talbot Street in Dublin City Centre utilising the R132 road for a large portion of its journey.

The northern railway line runs to the east of Julianstown, through Laytown and onto Drogheda. With the electrification of the DART line to Drogheda, a modal switch is expected, with a 46 per cent increase in DART usage coupled with an 11 per cent decrease in regional buses. The expected increase for the Drogheda/Laytown southbound DART is from approximately 1,500 passengers in one morning hour to 3,060, with the new electrified service.

As per Table 2.1 below, there is a higher dependence on the car to get to work for the people of Julianstown, Bettystown, Laytown and Drogheda than the national average. Once school trips are included, the public transport share increases above the national average for the three areas, indicating a higher reliance on public transport for school journeys.

Table 2.1 Mode of Transport to Work and Work & School trips combined

	Work trip only		Work and school trips combined	
	<i>Car</i>	<i>PT</i>	<i>Car</i>	<i>PT</i>
Julianstown	78%	8%	58%	18%
Bettystown/Laytown	68%	15%	58%	23%
Drogheda	63%	9%	54%	14%
All of Ireland	62%	9%	58%	13%
<i>PT = Public Transport and includes private coach or minibus</i>				

Source Census 2016 POWSCAR data

For this option, we considered building a Park&Ride bus stop, with a dedicated Peak Time express service to Dublin Airport and to Dublin city centre.

It is not possible to give a definitive answer to potential modal shift to public transport (as this was not been modelled to date). However for the purpose of this scenario, we assume that a “minor modal shift could occur” and have made an assumption of a range of between 1 and 3 percent modal shift to public transport for this scenario. We expect the modal shift to be minor as there are existing bus and rail services. While some corridors are an exception, the majority of the Greater Dublin Area bus network is characterised by fragmented bus priority, frequent delays and unreliable services, which limit its appeal. Further traffic modelling is required to appraise this option.

2.2. Methodology

As indicated in the project background, this report has adopted a methodology compliant with the Public Spending Code and Common Appraisal Framework.

The Order of Magnitude Costs of proposed Options exceeds €5 million for alleviating the traffic problems in Julianstown but is below the €20 million threshold mandating a full Cost-Benefit Analysis or Cost-Effectiveness Analysis. Note that these figures are indicative, as the route selection and design are not determined at this point. The process of elimination of options was undertaken using a preliminary Multi-Criteria Analysis in this case. As Multi-Criteria Analysis assesses qualitative outcomes, a common scale is required to allow a level of comparability between various outcomes. The seven-point scale is from Project Appraisal Guidelines to fulfil this function, and colour coded to add further clarity (Table 2.1).

Table 2.1: Qualitative Rating Scale

Description of effects	Score
Major or Highly Positive	7
Moderate Positive	6
Minor or Slightly Positive	5
Not Significant or Neutral	4
Minor or Slightly Negative	3
Moderately Negative	2
Major or Highly Negative	1

Source: Transport Infrastructure Ireland (2017)

Multi-Criteria Analysis will be supplemented with the calculation of the Economic Net Present Value (ENPV) for each option in order to fulfil economic analysis requirements. Financial Analysis is to be completed per evaluation guidelines; this will be satisfied through the calculation of the Financial Net Present Value (FNPV). Sources of Funding Analysis will not be carried out in this case as the project is expected to be solely funded by the exchequer.

2.3. Assumptions

A number of assumptions are required to carry out an economic appraisal. Many of these assumptions such as discount rates are by the Department of Public Expenditure and Reform. A summary of assumptions adopted for this project are identified in Table 2.2.

Table 2.2: Appraisal Assumptions

Description	Relevance	
Discount Value	Discounting future values to take into account the time preference of money	5%
Construction Period	Period in which an asset is being constructed or prepared, prior to entering its useful economic life	1 Year
Construction Costs	Risk of cost inflation, or uncertainty of costs, at this preliminary phase	25%
Maintenance Costs	Ongoing costs after road is complete	€20,000 per km
Useful Economic Life: Roads	Economic Appraisal/Financial Appraisal	60 Year
Time Savings	In-work and commuter values of time as described in CAF and inflated by a productivity index	-
Conversion of AM peak hour model data to annual data	Assumption that benefits of options accrue in 6 hour timeframe only, for 253 working days in the year	1518 factor

Source: AECOM (2018)

This section has introduced the options, introduced the appraisal methodology, and described the assumptions used for this report. This information underpins the findings of the next three sections:

- Multicriteria Analysis
- Financial Appraisal
- Economic Appraisal.

3. Multicriteria Analysis

Multi-Criteria Analysis is an appraisal tool used to evaluate alternatives based on the identified criteria, ranked on the basis of an aggregation procedure. The appraisal criteria are made up of economic, safety, environment, accessibility and social inclusion, integration and physical activity components. There are appraisal sub-criteria associated each criteria category. The ranking system is on a Likert scale, between 1 and 7; ranging from highly negative (score of 1) to highly positive (score of 7).

Figure 3.1 Preliminary Multi-Criteria Analysis for Regional and Local Road Capital Projects – Appraisal Criteria, Sub-Criteria and Objectives

Appraisal Criteria	Appraisal Sub-Criteria	Objective
Economy	Transport Efficiency and Effectiveness	Reduce journey times? Sufficient cross section provided?
	Wider Economic Impact	Improve economic performance of area, e.g. reduce transport costs
	Transport Reliability and Quality	Improve journey time reliability, e.g. improve Urban Congestion, provide missing link to maximise return on investment
Safety	Collision Reduction (PIA/mvkm)	Reduce collision rate using RSA collision database for subject road section
	Security	Improve safety conditions for all road users, e.g. lighting, pedestrian crossing
Environment	Air quality	Impact on Emissions
	Noise and Vibration	Impact on road related noise and vibration
	Landscape and Visual Qty	Impact on heritage sites
	Biodiversity	Impact on biodiversity, e.g. Natura site / a particular habitat
	Cultural, Archaeological , Architectural Heritage	Impact of scheme on Archaeological sites or national monument
	Land Use	Impact on agricultural holdings/ farm severance
	Water Resources	Impact on water courses
Accessibility and social inclusion	Vulnerable groups	Impact on accessibility to key facilities, such as employment, education and healthcare for all road users, but in particular vulnerable groups
	Deprived Geographical area	Impact on accessibility to deprived areas e.g. a particular Rapid or CLAR area
Integration	Transport Objectives	Connectivity to NR's, Ports, Airports, Railways
	Land Use Integration	To meet Transport Objectives, e.g. planning documents, local, county, regional, national
	Geographic Integration	Enhanced regional accessibility and Connection between towns flagged in Nat planning Document
	Integration with other Government Policies	Scheme supports Govt policy e.g. strengthen rural economies and communities
Physical Activity	Opportunities for pedestrians and cyclists	Enhancements for pedestrians and cyclists e.g. footpaths, wider Hard shoulder

The output of AECOM's MCA analysis for the five options under assessment is presented in Figure 3.2.

Option 1, 'Do Nothing' option is not a tenable option in this analysis, scoring negatively on most sub criteria. The combined score for this option is 59. This was the only option that did not have a positive impact. A negative scenario is any which scores less than 76.

Option 2, the 'South Drogheda distributor road' scored positively on the economic indicators, but was neutral in terms of most other appraisal criteria. This option scored a combined value of 80.

Option 4, 'Link road from M1 to R132', scored positively on Economy criteria, signifying an ability to relieve the traffic volumes passing through Julianstown, thereby improving physical activity opportunities in the village itself. A positive score on the accessibility criteria was due to the ability to alleviate congestion in and around the school.

Option 5, 'Public transport investment' was neutral for most categories, but scored highly for the Integration criteria, and alignment with wider societal transport goals. It did not improve the Economy criteria significantly, as there is not enough information to assess the potential impact on traffic through the village. However, investment in additional public transport was considered to have limited transport efficiency on its own; busses share the existing road network. We suggest that this option is explored in more detail in subsequent appraisal stages.

Option 3, 'Local bypass' attained the highest score out of all the options. It had positive values for economy, safety and environment. It was the option with the greatest ability to relieve the traffic volumes travelling through Julianstown. It also scored highly on noise and vibration reduction in the village, and on heritage values (as it enabled other heritage objectives to be pursued). This option scored negatively for land use, as all the 'do something' options did. It scored negatively on the transport objectives, as it does not reduce dependency on private vehicles.

Note biodiversity and water resources criteria were not considered in great detail in this preliminary appraisal, given that all the routes and options are indicative. It is noted that the River Nanny Estuary and Shore Special Protection Area lies to the north-east of Julianstown.

It is clear from this analysis that the preferred Option 3 has the most beneficial outcomes. Option 4 improves the core objective of traffic alleviation in Julianstown, while Option 5 requires more detail to assess the extent of achieving traffic alleviation objectives, but scores highly in terms of broader societal objectives. Option 2 marginally improves traffic volumes across the modelled network, but did not improve Julianstown traffic, and did not score positively on other criteria. Option 1, do nothing, is the only option that led to negative outcomes, with increasing traffic pressure in Julianstown, with accompanying associated negative effects.

Multicriteria Scoring for five options

Appraisal Criteria	Appraisal Sub-Criteria	Option 1	Option 2	Option 3	Option 4	Option 5
		Do Nothing	East west distributor road, south of Drogheda	Local Bypass	New link road from M1 to R132, north of Julianstown	Public transport investment
Economy	Transport Efficiency and Effectiveness	2	5	7	5	4
	Wider Economic Impact	3	5	5	5	4
	Transport Reliability and Quality	3	5	5	5	5
Safety	Collision Reduction (PIA/mvkm)	4	5	5	4	4
	Security	3	4	7	5	5
Environment	Air quality	3	5	5	4	5
	Noise and Vibration	2	4	7	5	4
	Landscape and Visual Qty	3	4	5	4	4
	Biodiversity	4	4	4	4	4
	Cultural, Archaeological , Architectural Heritage	2	4	6	4	4
	Land use	4	3	3	3	3
	Water resources	4	4	4	4	4
Accessibility and social inclusion	Vulnerable groups	3	4	6	5	4
	Deprived Geographical area	4	4	4	4	4
Integration	Transport Objectives	2	4	3	4	5
	Land Use Integration	3	4	5	5	7
	Geographic Integration	3	4	4	4	7
	Integration with other Government policies	4	4	5	4	4
Physical Activity	Opportunities for pedestrians and cyclists	3	4	5	5	5
Total MCA Score		59	80	95	83	86

Ranking system

7=Major or highly positive	6=Moderately Positive	5=Minor or slightly positive	4=Not significant	3=Minor or slightly negative	2=Moderately negative	1=Major or highly negative
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4. Financial Appraisal

A preliminary financial appraisal of the new roads was undertaken. The purpose of this is to weigh up the likely costs and benefits of a project before deciding on the correct course of action.

Financial appraisal includes the calculation of the net cash flows over the economic life of the asset. Financial flows will be discounted to account for the time value of money. Sources of funding analysis will not be completed. The indication to AECOM is that full funding will be sought from the exchequer.

Financial evaluation is used in the private sector to inform investment decisions. Within the public sector, the role of financial evaluation is less pronounced. As financial appraisal only considers monetary flows, it fails to capture the non-monetary objectives of the public sector. It therefore has limited potential to determine whether a project is socially valuable. Despite these drawbacks, financial analysis is useful to the exchequer as a budgetary planning and management tool.

4.1. Investment Costs

Construction costs per km of road built were used for the indicative routes identified in the options. These costs were taken from the recent construction of a distributor road in the Greater Dublin Area. We stress these costs are indicative only. A cost price inflation factor of 25 per cent was included, to allow for the uncertainty of these figures, and given that no design specifications are available at this point. These figures are shown in Table 4.1

Table 4.1: Investment Calculations, Nominal, 2018 €million

Option	Construction Costs (2018€ million)	Land and Property Costs (2018€ million)	Total (2018€ million)
Option 1 a 'do nothing', or baseline scenario/option			
Option 2 east-west distributor road to the south of Drogheda	13.84	4.73	17.75
Option 3 local bypass of Julianstown	14.66	4.01	18.67
Option 4 new link road from the M1 to the R132 north of Julianstown	9.11	2.49	11.60
Option 5 investment in other transport modes	unknown	2.5	Unknown

Source: AECOM (2018)

Options 2 to 4 result in a net increase in road surface area, so an increase in annual operating/maintenance costs of €20,000 per kilometre was included.

Revenues

The 2015 transport modelling of the three road options identified revenue impacts on the M1 toll road. These revenues were included in the financial analysis, but excluded from the economic analysis. For the South Drogheda distributor road and the Julianstown bypass, M1 Toll revenue increased marginally. The new link road from north of Julianstown to the M1 (including a new junction, south of the toll gates) could result in 5 per cent drop in toll revenue. This is because it enables toll avoidance via the new link road – the road would not have the time delays that the current R132 has, and would be more attractive for more Drogheda traffic.

Table 4.2 Modelled revenue impacts at M1 toll plaza

	Base	Option 2	Option 3	Option 4
AM Peak Traffic Flow (vehicles per hour)	2,330	2,333	2,337	2,221
Annual Average Daily Traffic	72,066	72,145	72,315	68,341
Annual Revenue Estimate	€26.3 million	€26.3 million	€26.4 million	€24.9 million
% Change		+0.1%	+0.3%	-5.2%

No other revenue impacts were identified or analysed at this preliminary stage.

Financial Net Present Value (FNPV)

Financial Net Present Value (FNPV) is the sum of discounted net economic flows over the appraisal period. The purpose of this metric is to estimate the total net monetary cost of a project over an appraisal period.

As the justification of most publicly constructed roads is primarily on economic grounds, and not financial, it is not surprising that the options resulted in negative FNPV. However, the FNPV for the new link road significantly spirals, given the toll avoidance that would result in lost income to the M1 public private partnership.

Table 4.2: Financial Net Present Value Calculations after 60 years, Discounted

Option	€m
Option 1 a 'do nothing', or baseline scenario/option	0
Option 2 east-west distributor road to the south of Drogheda	-€18.571 million
Option 3 local bypass of Julianstown	-€17.829 million
Option 4 new link road from the M1 to the R132 north of Julianstown	-€33.016 million

Source: AECOM (2018)

In conclusion, this section has estimated the budgetary implication of the three new road options proposed. Options 2 and 3 have a moderate negative FNPV, whereas the negative revenue impacts of option 4 are likely to rule it out for further consideration.

5. Economic Appraisal

The purpose of this section is to weight up the economic costs and benefits of a project before deciding on the correct course of action. Following on from the qualitative outcomes identified in the Multi-Criteria Analysis in the previous section, this financial and economic appraisal elaborates the options using preliminary quantitative data.

Quantitative outcomes will be captured through the calculation of an Economic Net Present Value (ENPV). Values will be represented incrementally versus the 'Do Minimum'. Calculations include construction and upkeep costs for the infrastructure along with projected benefits arising for projected commuter time savings and vehicle operating costs.

Economic evaluation is a technical exercise, care and attention is required so that errors such as double-counting, incorrect use of parameters and estimation inaccuracies are minimised. As the intended purpose of this report is for preliminary analysis only, we suggest that further work will be required to explore some of the parameters where full data was not available. We highlight these data and knowledge gaps.

Ultimately, economic evaluation requires the forecasting of future activity, which may yield mixed results. Every effort has been made to ensure that future forecasts within this report are as robust as possible and adhere to official evaluation guidelines.

Time Savings

Transport projects typically incorporate time savings as an economic benefit, and typically account for a significant share of the benefits. Values of time vary according to journey purpose. Benefits amount to an aggregation of time savings across many users. Construction of the three new road options all led to AM peak time savings. For the south Drogheda distributor road, this time was a total of 47 hours (accrued in a one hour modelled period). The figure for the Julianstown bypass was a saving of 118 hours, and for the Link road, a saving of 149 hours travelled. No data was available on time savings for the public transport option, however it is noted that it is unlikely that benefits for bus travel time would be realised under a 'do nothing' situation, as the buses share the roads with existing traffic. More data is needed on the effect of time savings if a dedicated bus lane were added onto any of the new roads.

Economic Net Present Value (ENPV)

Economic Net Present Value (ENPV) is the sum of discounted net economic and financial flows over the appraisal period. The purpose of this metric is to estimate the total economic net benefit of a project over an appraisal period accounting for the time value of benefits. These are discounted values, given the time-preference of money, with higher values in the near future.

Table 5.1: Economic Net Present Value Calculations, Discounted

Option	Economic Net Present Value €m	(of which, discounted total costs €m)
Option 1 a 'do nothing', or baseline scenario/option	0	0
Option 2 east-west distributor road to the south of Drogheda	€23.45	€19.2
Option 3 local bypass of Julianstown	€85.74	€19.3
Option 4 new link road from the M1 to the R132 north of Julianstown	€126.43	€11.8

Source: AECOM (2018)

This economic appraisal differs from the financial appraisal as it includes non-monetary flows. In particular, it is based on the time benefits that result from the options considered. The results will help steer the option selection decision. Option 4, the new link road has the highest ENPV, given that this option has the greatest time and kilometre savings of the three options. This is despite the loss of revenue to the M1 tolls – indicating that there is a significant behavioural change regarding route, under this scenario.

6. Conclusions

A 'do nothing' option is not considered tenable, given the qualitative scoring of the multi criteria analysis. 'Do something' options have a range of merits. The link road from the north of Julianstown to a new junction on the M1, south of the toll plaza reduced Julianstown's traffic congestion by 25 per cent only, but had the greatest time savings of the three road options analysed. However, it had high financial impact, with the loss of toll revenue and the diversion of traffic through the new link road. The South Drogheda distributor road had the lowest benefit to cost ratios out of the appraised road options.

Option 3, the bypass of Julianstown emerged as the preferred option in both the Multi-criteria Analysis and preliminary cost benefit analysis, although it should be noted that the public transport investment option was not fully costed at this time.

		Options/Scenario				
Category	Criteria Description	I	II	III	IV	V
Economy	Transport Efficiency and Effectiveness: Reducing journey times	2	5	7	5	4
	Wider Economic Impacts: Reducing transport costs	3	5	5	5	4
	Transport Reliability and Quality: Improving congestion	3	5	5	5	5
Safety	Collision Reduction: Road Safety Authority guidelines	4	5	5	4	4
	Security: Removing safety issues for all road users	3	4	7	5	5
Environment	Air Quality: Removes emissions from urban environment	3	5	5	4	5
	Noise and Vibration: Removes noise and vibrations from Village.	2	4	7	5	4
	Landscape and Visual Quality:	3	4	5	4	4
	Biodiversity: Natura 2000 sites, particular habitats.	4	4	4	4	4
	Cultural, Archaeological, Architectural Heritage:	2	4	6	4	4
	Land Use: Impact upon existing land uses	4	3	3	3	3
	Water Resources: Effect on water courses	4	4	4	4	4
Accessibility & social inclusion	Vulnerable Groups: access to schools	3	4	6	5	4
	Deprived Geographical Area: n/a	4	4	4	4	4
Integration	Transport Objectives: Strategic Connectivity	2	4	3	4	5
	Land Use Integration: Local planning objectives	3	4	5	5	7
	Geographic Integration: Enhanced regional accessibility	3	4	4	4	7
	Integration with other Government policies: Compatibility with wider policy	4	4	5	4	4
Physical Activity	Opportunities for pedestrian and cyclists	3	4	5	5	5
Benefit to Cost Ratio						
30 Year Appraisal		1.56	3.9	3.35	Not	
60 Year Appraisal		2.25	5.8	4.28	calculated	

